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TO

VITAL STATISTICS:

BEING,

A DEVELOPMENT OF THE RATE OF MORTALITY AND THE LAWS OF SICKNESS,

FROM ORIGINAL AND EXTENSIVE DATA;

WITH

AN INQUIRY INTO THE INFLUENCE OF LOCALITY, OCCUPATIONS, AND HABITS OF LIFE ON HEALTH;

AN

ANALYTICAL VIEW OF RAILWAY ACCIDENTS;

AND

AN INVESTIGATION INTO THE PROGRESS OF CRIME IN ENGLAND AND WALES.

BY

F. G. P. NEISON, F.L.S. &c.

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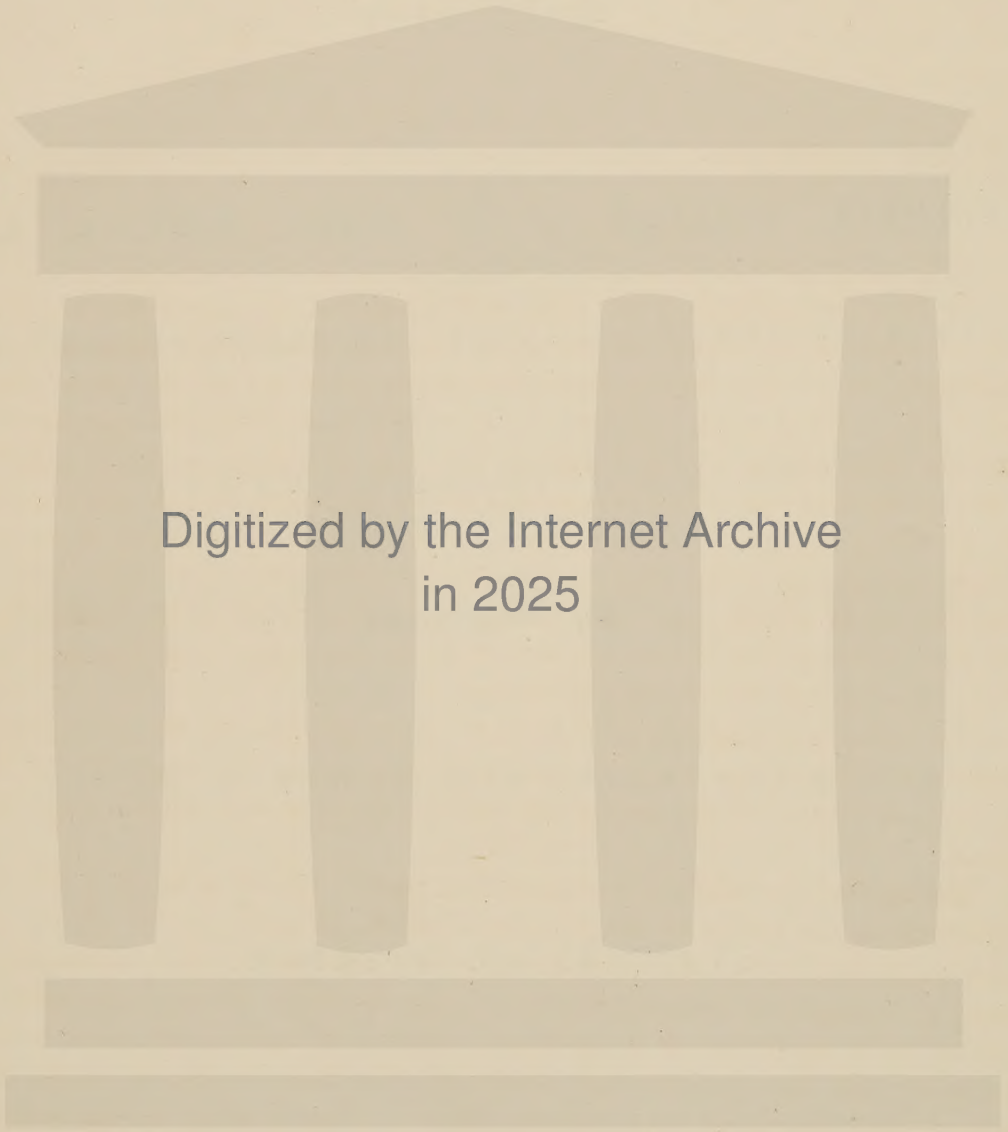
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PREFACE.

In the present edition of this work will be found a very large amount of new matter, most of which it is believed is calculated to throw considerable light on questions of importance, which have been engaging the public mind for several years. The greater part of pp. 1–101 is nearly the same in form with that of the first and second editions, while the matter in pp. 102–407, and pp. 531–606 did not appear in the earlier editions. A large portion of pp. 408–530 appeared in the first and second editions, and also in the thirteenth edition of "Observations on Odd Fellow and Friendly Societies," which is now out of print; but even a perusal of these pages will shew that they contain a great amount of entirely new data, having not only an important bearing on Friendly and Provident Societies, but on questions of serious importance in public Hygiene, and to which attention will be immediately directed.

The data from which has been deduced the expression for the general mortality of England and Wales, and which is used as a standard for the comparison of the results for sectional classes of the community, will be found in a condensed shape in Table B, page 4.

Throughout the whole of the three first papers, embraced in pp. 1–101, and more particularly in the Letter to the Registrar-General, given in pp. 13–15, the conditions under which sanitary investigations should be conducted are very fully discussed; and it is greatly to be regretted that the precautions pointed out are not more generally attended to in all such inquiries. It is perhaps impossible to point to any other investigations connected with the governmental departments of the country, in which less skill, judgment, and tact, have been evinced than in those bearing on the sanitary state of our large towns and cities; and hence the most unsatisfactory results of the vast amount of labour and enormous expenditure of money, particularly within the last dozen of years, without any improvement in the health of the population being effected. That the methods of investigation followed by those entrusted with the conduct of the sanitary

movement would be followed by no satisfactory result, was clearly foretold in the first edition of this work, published in 1845; and the same errors of method were also subsequently alluded to in the Reports of the Registrar-General himself; but not with that fulness, force, and urgency by which, from his important position and authority, no doubt, a powerful impression would have been made on the country, and thence on the departments entrusted with the regulation of sanitary measures. Relying on the evidence to be derived from the Returns of the Registrar-General, it would appear that the health of the country, instead of improving, is actually gradually deteriorating, and particularly so since the time the Sanitary Commissioners commenced to stir most actively in the health of towns. This fact is most strikingly exhibited by the following figures derived from the Returns of the Registrar-General.

The results in the second column of each section of the following Abstract exhibits the rate of mortality for males in England and Wales during the seven years 1838–44, and are derived from page 177 of the Registrar-General's ninth Report; and those in the third column are the corresponding results for the ten years 1845–54, and are taken from page xvi of his seventeenth Report.

The same figures will likewise be found in page 87 of the Appendix to the seventeenth Report. The last column of each section shews the excess of mortality per cent. in the more recent period of years.

Rate of Mortality per Cent. per Annum in England and Wales during the Seven Years 1838–44, *and the Ten Years* 1845–54.

Ages.	MALES.			FEMALES.			Ages.
	1838—44 (*a*)	1845—54 (*b*)	Excess per Cent. of (*b*) over (*a*).	1838—44 (*a*)	1845—54 (*b*)	Excess per Cent. of (*b*) over (*a*).	
0 to 4	7·072	7·356	4·016	6·037	6·343	5·069	0 to 4
5 ... 9	·926	·916	— 1·080	·900	·895	— 0·556	5 ... 9
10 ... 14	·504	·523	3·770	·548	·546	— 0·365	10 ... 14
15 ... 24	·805	·833	3·478	·833	·863	3·601	15 ... 24
25 ... 34	·968	1·015	4·855	1·009	1·083	7·334	25 ... 34
35 ... 44	1·249	1·309	4·884	1·242	1·293	4·106	35 ... 44
45 ... 54	1·776	1·895	6·700	1·548	1·617	4·458	45 ... 54
55 ... 64	3·141	3·226	2·706	2·782	2·855	2·624	55 ... 64
65 ... 74	6·613	6·755	2·147	5·885	6·104	3·721	65 ... 74
75 ... 84	14·394	14·991	4·147	13·201	13·652	3·416	75 ... 84
85 ... 94	29·646	30·294	2·186	27·553	28·076	1·898	85 ... 94
95 and upwards.	42·697	45·219	5·906	40·795	45·226	10·861	95 and upwards.
All Ages.	2·270	2·364	4·141	2·104	2·205	4·800	All Ages.

It will be thus seen, that during the ten years 1845–54, the mortality for the male sex exceeds that for the seven years immediately preceding, by no less than 4·141 per cent.; and the excess for the female sex during the same period is as much as 4·800 per cent. These are results for which those who sanctioned the various sanitary movements which have agitated the country during the last thirteen or fourteen years were certainly not prepared, and it must be confessed that if the causes which influence the mortality taking place amongst the population of this country are within the control of the various Commissions and Boards which have, from time to time, been appointed for the superintendence of health, there must have been existing, during the last ten years, some unhappy combination of circumstances, which has not only neutralised the intended effect of any measures which have been carried out, but has added from four to five per cent. to the general rate of mortality which prevailed during the preceding seven years. It is of course not to be supposed that sanitary measures can be instantly carried out, and their effects immediately seen; but the period embraced in the preceding illustration is an extended one, and it would almost appear that, with the advance of time, the greater has been the rate of mortality amongst the population. It may be said that the period of ten years, in which this excessive mortality has taken place, embraces the epidemical years 1849 and 1854, in which cholera and diarrhœa raged so triumphantly; but even assuming that such epidemics are entirely beyond the reach of sanitary measures, and excluding those two years from the comparison, the remaining eight years of the period would still exhibit an excess of mortality of 2·511 per cent. for males, and of 2·947 for females. The following will afford a ready means of forming an opinion on this question:—

Mortality per Cent. amongst Males at various ages in each of the Seventeen Years, 1838–54.

Ages.	1838.	1839.	1840.	1841.	1842.	1843.	1844.	1845.	1856.	1847.	1848.	1849.	1850.	1851.	1852.	1853.	1854.	Ages.
0 to 4	7·041	7·167	7·542	6·843	7·048	6·898	6·984	6·665	7·760	7·588	7·401	7·513	6·695	7·298	7·500	7·346	7·795	0 to 4
5 .. 9	·901	·904	1·083	·956	·901	·844	·897	·823	·825	·970	1·043	1·124	·814	·869	·906	·847	·935	5 .. 9
0 .. 14	·519	·512	·542	·510	·501	·478	·473	·466	·507	·550	·530	·646	·467	·491	·520	·506	·550	10 .. 14
5 .. 24	·851	·819	·832	·811	·783	·772	·763	·781	·859	·929	·858	·951	·717	·776	·799	·828	·835	15 .. 24
5 .. 34	1·064	·986	·995	·978	·928	·924	·940	·926	1·025	1·100	1·026	1·243	·879	·948	·968	1·013	1·025	25 .. 34
5 .. 44	1·342	1·255	1·266	1·217	1·197	1·218	1·225	1·202	1·272	1·436	1·303	1·581	1·165	1·236	1·230	1·316	1·349	35 .. 44
5 .. 54	1·949	1·978	1·796	1·785	1·733	1·722	1·750	1·715	1·800	2·065	1·864	2·262	1·716	1·787	1·816	1·958	1·962	45 .. 54
5 .. 64	3·410	3·192	3·142	3·137	3·041	3·008	3·051	2·975	3·129	3·649	3·266	3·655	2·980	3·031	3·073	3·278	3·227	55 .. 64
5 .. 74	6·916	6·421	6·678	6·482	6·595	6·578	6·736	6·491	6·758	7·696	6·793	7·244	6·306	6·396	6·284	6·912	6·665	65 .. 74
5 .. 84	14·752	13·874	14·488	14·266	14·578	14·090	14·651	14·400	15·070	17·326	14·986	15·187	14·019	14·055	14·161	15·897	14·808	75 .. 84
5 .. 94	29·745	27·923	30·242	29·650	29·438	28·758	31·716	30·191	32·214	35·553	30·622	29·976	28·555	28·245	28·279	31·297	28·003	85 .. 94
5 and upwards.	49·699	43·112	48·498	46·633	46·427	45·681	43·228	49·035	51·651	56·607	42·435	42·859	38·560	41·937	43·422	47·305	38·382	95 and upwards
All Ages.	2·335	2·275	2·372	2·238	2·241	2·202	2·242	2·170	2·395	2·546	2·391	2·581	2·143	2·276	2·320	2·379	2·434	All Ages.

It is thus evident that in the more recent years there is a general tendency to increased mortality amongst males; and like results will be observed in the following Abstract for female lives:—

Mortality per Cent. amongst Females at various ages in each of the Seventeen Years, 1838–54.

Ages.	1838.	1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.	1848.	1849.	1850.	1851.	1852.	1853.	1854.	Ages.
0 to 4	6·047	6·138	6·432	5·861	6·023	5·897	5·885	5·657	6·675	6·553	6·396	6·488	5·738	6·299	6·445	6·362	6·814	0 to 4
5 .. 9	·895	·935	1·113	·963	·925	·848	·902	·800	·813	·951	·997	1·102	·810	·860	·878	·813	·924	5 .. 9
10 .. 14	·543	·535	·569	·520	·512	·485	·503	·476	·533	·577	·566	·653	·491	·527	·537	·540	·560	10 .. 14
15 .. 24	·854	·848	·868	·842	·830	·784	·810	·815	·870	·919	·878	1·000	·777	·818	·834	·861	·859	15 .. 24
25 .. 34	1·046	1·007	1·033	1·007	1·005	·976	1·006	·980	1·048	1·173	1·090	1·347	·988	1·005	1·031	1·064	1·102	25 .. 34
35 .. 44	1·313	1·248	1·269	1·227	1·220	1·227	1·200	1·188	1·242	1·422	1·301	1·617	1·169	1·193	1·214	1·251	1·328	35 .. 44
45 .. 54	1·660	1·549	1·567	1·542	1·526	1·484	1·525	1·467	1·559	1·789	1·589	1·998	1·473	1·519	1·514	1·596	1·663	45 .. 54
55 .. 64	2·977	2·730	2·829	2·740	2·744	2·692	2·773	2·668	2·783	3·226	2·860	3·355	2·625	2·679	2·660	2·845	2·852	55 .. 64
65 .. 74	5·919	5·554	5·899	5·841	6·013	5·877	6·052	5·856	6·156	6·964	6·072	6·596	5·717	5·854	5·708	6·133	5·979	65 .. 74
75 .. 84	13·281	12·519	13·541	13·375	13·084	13·037	13·494	13·036	13·794	15·945	13·604	14·028	12·684	12·818	13·177	14·106	13·325	75 .. 84
85 .. 94	26·463	25·242	28·394	28·255	28·438	27·655	28·434	27·569	30·350	32·104	27·623	28·028	25·922	26·357	27·427	28·968	26·412	85 .. 94
95 and upwards.	41·099	39·915	46·199	45·907	42·832	46·679	44·616	42·036	52·200	53·230	46·816	43·323	42·927	45·017	40·676	45·770	40·268	95 and upwards.
All Ages.	2·133	2·090	2·203	2·083	2·098	2·047	2·083	2·012	2·221	2·380	2·224	2·445	2·013	2·124	2·156	2·201	2·273	All Ages.

Whatever opinions may be entertained on the merits of the methods now being employed for the improvement of the health of towns, there can be no doubt that, so far as the returns of the Registrar-General afford the means of judging, the rate of mortality has been considerably increased in recent years. It is much to be regretted that the Registrar-General should not, in his Annual Reports, enter on a full discussion of this question, and endeavour to shew, from the ample body of facts in his possession, the changes which are from time to time taking place coincident with the presumed improvements introduced under the superintendence of the Board of Health, in the different districts of the kingdom. Certainly one of the main objects contemplated by the Registration Act is to pronounce, from time to time, upon the changes in the rates of mortality in different districts, and the causes to which they are due. Perhaps no other documents issued under the auspices of the Government are so pregnant with curious, and in many instances, important speculations; but the great problem as to the effect which the sanitary measures of the last dozen of years has had on the public health has been all but overlooked by him. The districts and sub-districts under the Registration Act enable him to determine, from year to year, with great nicety, the differences of mortality taking place within very limited localities; and as these districts can always with much precision, be connected with those in which the various measures are carried out by the inspectors and other officers of health, it is not too much to expect some distinct

information in regard to the actual influence those measures may have had on the mortality of the districts in which they have been in operation. With anything short of this, the public should not be satisfied. The Sanitary Commission is a most expensive one, and the country should be informed of the advantages derived from so great an outlay. Twelve years ago, a vast effort was made by an influential sanitary reformer, to shew that certain conditions, peculiar to some Metropolitan districts, produced the most wonderful destruction of human life as compared with the results of other districts; but it was subsequently found that the same data which led him to these conclusions did, when properly treated, prove the very opposite state of things to be the fact, and hence the caution needed in all such inquiries. As already stated, the Registrar-General has, in one of his Reports, noticed the fallacious methods of inquiry employed in the Health of Towns' Reports in question; but he is called on to go much further, for by virtue of his office he should interrogate the influence of all the measures carried out for promoting the public health, and should set forth in his Reports how far they have been successful or otherwise. Not only has the Parliament, but the people of this country, a right to the most ample and conclusive information on this subject.

The Registrar-General has for the first time in his Fourteenth Report attempted to throw some light on the influence of particular employments and occupations on health. The necessity of an inquiry into this question was pointed out to him in my letter of the 22nd March, 1845, see pp. 13–15 *seq.*, but while engaged in the preparation of that Report, he does not appear to have been aware of the remarkable illustrations of the influence of employments on health given in the previous editions of this work, as well as in the publication by Mr. Ratcliffe in the year 1850. It may also be here pointed out, that data derived from the sources from which the results in the following pages are deduced, as well as those appearing in Mr. Ratcliff's Analysis, are free from some objections to which the Registrar-General's Returns are unavoidably subject. Any one who is well acquainted with the condition and habits of the working classes must know how much more than usual those following some particular occupations are addicted to drinking and intoxicating habits, and therefore in viewing the general mortality of those particular employments, there is seen not only the mortality due to that branch of industry, but also the augmented ratio arising from indulgence in the too general habits of dissipation. The data collected from the records of Friendly Societies are however almost entirely free from such objections, for it is well understood that the working men who enter Benefit Societies and subsequently fall into irregular habits, soon after cease membership from inability to continue their periodical contributions to the club, and hence results deduced from observations made on those who maintain membership may be regarded as fairly indicating the relative degree of mortality to which those following various occupations are subject. In the following contributions a large amount of data is given not only on

that subject, but also on the ratio of sickness characteristic of different employments. From the observations contained in pp. 12–16, it will be seen that until the period of the next census in 1861, little reliance can be placed on the deductions made in the Reports of the Registrar-General in regard to the sanitary condition of different occupations. In page xxii of his Fourteenth Report he remarks that "the extraordinary mortality of "butchers appears to have escaped observation," but on referring to page 94 of the first edition of this work, or page 411 *seq.*, it will be found to be distinctly pointed out that they experience a very high rate of mortality although not subject to above the average amount of sickness.

The Appendix to the Eighth Report of the Registrar-General contains a document of the highest value in throwing light on a question but indifferently understood at present, even by those giving much attention to vital statistics, namely, the great prolongation usually supposed to have taken place in the duration of life in this country within the last hundred or one hundred and fifty years.

The history of the progress of early inquiries made into the rate of mortality in different classes is too obscure to throw much light on this question, and it may therefore be sufficient to commence our observations on it from the period when the most active and successful efforts were made to impress on society the importance of having strict regard to well ascertained laws of mortality, in pecuniary transactions on life.

The honour of this great achievement in human knowledge belongs to the celebrated Dr. Price, and to the effect of his writings is mainly traceable the origin of the opinion, that in recent years the duration of life is much prolonged. The well-known Table of Mortality, usually, though erroneously, called the Northampton Table, and which is based on facts relating to the middle of the last century, exhibits a certain duration of life, and, for a long time, this Table continued to have undivided sway and authority in the estimation of writers and those engaged in assurance transactions, as indicating a near approximation to the rates of mortality among certain classes of the community.

At last, however, the late Mr. Milne brought under public attention the Table of Mortality, known as the Carlisle Table, and although the data embodied in it had reference to a period not much subsequent to the time to which the Northampton Table relates, still, from its more recent promulgation, the impression produced on the public mind was that which would naturally arise from other scientific writings, that each table represented the state of the science at a period near to the date of its first appearance.

The remarkably increased duration of life shewn by the Carlisle over the Northampton Table could not fail to arrest public attention, and the elaborate and able work in which Mr. Milne had issued his Table into the world claimed for it an importance and consideration not before conceded to even the labours of Dr. Price himself.

An examination of the writings of this period will at once satisfy any inquirer, that, a very short time after the appearance of Mr. Milne's work, the Carlisle Table began to grow in favour and public estimation, and hence, owing to the misconception that its recent appearance was evidence also of the recent origin of its data, and, owing to the increased duration of life deducible therefrom, an opinion prevailed that, since the appearance of Dr. Price's writings, an improvement had taken place in the public health. This impression has continued to gain ground until the present hour. It is consequently important to test the correctness of this opinion, not only from its bearings on legislative proceedings, but also from the remarkable hold which both classes of results have taken of the assurance interests of this country as well as of those on the Continent.

At first glance it must be evident that, from the almost cotemporaneous but remote origin of the data of both Tables, the observable difference in their rates of mortality could not be held to shew any improvement in the duration of life within recent periods; besides, if a difference really does exist in their rates of mortality, that difference can be supposed to be only due to the local circumstances and influences peculiar to the small districts from which the data were collected, and, however true the results may be considered in regard to the district so represented by the data, it is impossible, from their evidence alone, to regard either as a type of the rate of mortality prevailing, at a former or the present period, among either the assurance classes, here or elsewhere, or as affording any evidence of the rate of mortality in the country generally, or in individual classes of the population.

Having said this much on the influence which the Northampton Table has exercised on the public mind, it is a very curious if not a mortifying circumstance to discover, at this advanced stage of our progress, that the gigantic monied interests of our greatest companies have long relied, almost exclusively, on a Table which has been falsely constructed, and which, in fact, does not represent the rate of mortality, even in the locality from which the data have been collected, nor, as will hereafter appear, the rate of mortality in the country generally, nor among the assured portion of the community.

As already stated, the Appendix to the Eighth Report of the Registrar-General contains one of the most valuable and interesting papers ever published in connection with the Northampton Table. Not only in an historical point of view, but also on account of its practical applications, the paper is one of first importance to life offices. To the author, Dr. Farr, the assurance interests of this country must be considered deeply indebted.

At the period when Dr. Price constructed the celebrated Northampton Table he did not possess all the elements necessary to determine correctly the rate of mortality in the locality under investigation, and, to supply the defective element, he had recourse to an hypothesis which recent inquiries have proved to be erroneous.

This should not be considered in the light of a reflection on Dr. Price, for there is reason to believe that, with the imperfect materials at his command, it would have been difficult to have followed a better plan than that which he adopted; but still Dr. Farr has been enabled to advance historical evidence to shew that the hypothesis was a fallacious one, and that, consequently, the rate of mortality deduced therefrom is also erroneous.

From the deaths which have taken place in "All Saints" parish, Northampton, during the seven years, 1838–44, being the same district to which Dr. Price's facts relate, Dr. Farr has constructed a Table of Mortality, on the plan adopted by Dr. Price in the construction of his Table for the forty-six years, 1735–80, and, although an interval of sixty years has elapsed between the periods to which each class of facts belong, still it is curious to find that little or no change has taken place in the rate of mortality, and the one Table might be used for the other.

It is however important to understand that the method followed by Dr. Price in the construction of his Table is now admitted by all authorities to be wrong, and any one who, at this time, would venture upon a similar course must necessarily sacrifice all public esteem for scientific accuracy.

The parallel Table by Dr. Farr has been purposely constructed on the same plan, and the results of both agree so closely that it is impossible for any one to argue therefrom, that since the middle of last century any improvement whatever has taken place in the duration of life in Northampton.

Dr. Farr has, however, not stopped at this stage of the inquiry, but has gone further. He has formed a Table on true principles from the data referred to, for the seven years 1838–44, and the results arrived at do not differ widely from the rate of mortality shewn in Mr. Milne's Carlisle Table and other Tables still more recently promulgated.

If, therefore, the facts treated by Dr. Farr on true principles shew so great an improvement in life, there is every reason to believe that the materials with which Dr. Price had to deal would also have shewn similar results had they been properly treated, and consequently, so far as the Northampton and Carlisle Tables are concerned, there is no reason to believe that any augmentation has taken place in the duration of life during the last hundred years.

The Northampton and Carlisle Tables have been dwelt on from the importance they have assumed in the practice of life offices.

There are, however, other local Tables, as the Chester and others, to which reference might be made if necessary. Proofs of the like stability in the rate of mortality may also be derived from observations of large masses of mankind.

The mortuary registers of Sweden, in a very complete form, go as far back as the

year 1751, and up to the present time no improvement appears to have taken place in the duration of life. The result for that kingdom for the last hundred years do not appear to differ much from the rate of mortality in this country during the last fifteen years.

Again, in France, if the Tables of Demonferrond are to be relied on, the value of life there does not differ in any material degree from that indicated by either of the other classes of results.

It is, however, right to remark that the French people, although so much advanced in scientific knowledge and civilisation, are still indifferent to the advantages of a proper census of the people, and M. Demonferrond has been compelled, owing to the ages of the population being unknown, to resort to an expedient in the construction of his Table which, although generally unsafe, may in his particular instance probably not affect the value of the results in any serious degree.

Life offices in this country have had their transactions almost exclusively with the middle and upper classes, and the same remark is to a great extent applicable to the experience of companies on the Continent and in America; therefore whatever value may be attached to any of the mortality Tables hitherto referred to, they cannot, in the absence of other evidence, be considered as strictly applicable to the purposes of assurance companies.

The public is indebted to the elder Mr. Finlaison for what is called the Government Tables; but these, irrespective of inherent evidence of anomalous conditions, could scarcely be thought applicable to the purposes of a life office: for as the bulk of the data has reference to a remote period of years, if any value is to be attached to prevailing opinions on the recent improvement of life, the data must be wholly inapplicable to the present time.

It may also be here remarked that, as pointed out in page 42 *seq.*, that those usually quoted as the Government Tables are not those based on the corrected and revised data of 1829; but the Tables given in the Reports of 1824, and that which the public really speak of as being the Government Table, is not in fact the one finally adopted. We have, however, Tables derived directly from the experience of life offices,—the Equitable and Amicable Societies,—but the bulk of the facts of both Tables relates to remote years, and therefore if any importance is to be attached to the recent improvement in life they are clearly not applicable to the present operations of assurance companies.

There is likewise the Table usually denominated the "Experience Table," deduced from the recorded observations of fifteen life offices, in addition to those of the Equitable and Amicable Societies already mentioned, reported on by the committee of actuaries appointed in the year 1839. In these observations, like those deduced from the Amicable and Equitable Life Offices, the principal portion of the data has no reference to recent years; but there is a much more serious objection to be brought against the results given

in the " Experience Table." From the indisposition evinced by the contributing offices to let their individual experience be known, even to the members of the committee to whom the inquiry was entrusted, it became necessary that the different schedules should be submitted in an anonymous form: all were given with blank headings, and so completely mixed up together that it was impossible afterwards to determine from what office any particular schedule came.

This arrangement prevented the investigation being any other than one confined to policies issued by those offices, and not an estimate of the mortality among a certain number of lives.

To those, therefore, of even limited experience, it must be obvious that the results are thereby deprived of all value as indicating the rate of mortality among the offices contributing the facts.

Nothing is more notorious than the frequency with which the same life is assured in duplicate and triplicate, not only in the same office but in several offices, and it often happens that on the same life there has at one time or another been issued, as many as from twenty to fifty policies in the different offices conjointly. To take an extreme example, in order to shew the nature of the principle and its effect in vitiating the truth of any results derived from a calculation founded on the number of policies, and not upon the number of lives.

It is well known, in most of the assurance offices, that a distinguished personage was so fully assured in the life offices in this kingdom that it was impossible to obtain any further policies on his life from assurance companies, and it has been said that recourse was had to Lloyds to have the life underwritten there. The policies existing upon this life, at one time, it has been considered could not be less than three or four hundred. It is hence evident that a death taking place under such circumstances would, in the result of such inquiry, appear as three or four hundred deaths, while in fact only one had happened.

In like manner, the fact of the life still surviving would produce the anomalous result of there being 1000 or 2000 years of risk depending upon the duration of these policies without any recorded death.

It is therefore clear, that unless the principle of repeated policies on the same life was uniform as to numbers, and very generally characteristic of all the assurances effected, that compensation errors could not be expected to take place sufficient to render the results even a near approximation to the truth.

So far, therefore, we are yet without any satisfactory data, derived directly from the life offices of this country, which can be relied on as indicating the rate of mortality among the assured classes in recent years.

On the Continent, however, we have been furnished with the experience of the

Gotha Life Office, and in this instance the results are free from the objections just alluded to, as the investigation has been conducted on the number of lives, and not on the number of policies. The experience of the Gotha Life Office, as given in pp. 151–200, shews a remarkable and peculiar feature in the state of mortality to which the members are subject. At the younger ages, the mortality is much less than that indicated by any of the other Tables yet alluded to; but at the older ages the rate of mortality is very much greater.

At present it is difficult, if not impossible, to account for this peculiarity, whether it be due to the different circumstances and habits of life of our continental neighbours, or whether it arises from some mutation in the physical condition of the assuring classes in recent years, and is common to our own country, it is difficult to say, for we have no sufficient amount of data relating to the last twenty-five years, within which the facts of the Gotha Life Office are limited; but that some such explanation may be possible is supported by the large body of facts analysed in the following paper, on the Mortality of the Provident Classes in this Country and on the Continent.

Professor Gill, the late Actuary of the Mutual Life Assurance Company of New York, has reported on the rate of mortality among the members of that society, during the eight years which had elapsed between its establishment and February 1851, and although the experience is not so extensive as that of the Gotha Life Office, still it embraces between 17000 and 18000 years of life, and is therefore valuable and curious, as shewing the same peculiar features in the rate of mortality described as characteristic of the Gotha Company's experience, only at the older ages the mortality is even higher than that of the other.

It would certainly be of great importance to the interests of life offices to determine accurately whether this be a permanent feature of the mortality prevailing generally, not only in this country, but elsewhere, among the assuring classes; and it is to be hoped that an effort will be made at no distant date to collect and convey, in an intelligible and satisfactory manner, the experience of the different assurance companies.

It should not, however, be lost sight of, that the rapid extension of the practice of life assurance of late years will render the data derived from the past experience of life offices yearly less applicable to their future operations.

Hitherto Life Assurance has, to a great extent, been confined to the comparatively wealthy, but now the practice seems to extend to the less wealthy and the humbler classes, and is, in fact, almost universally recognised by the industrious workmen of the country in connection with Friendly and Benefit Societies.

It may be stated that there is little chance of a future generation of the gigantic corporations boasting of their millions of invested capital and revenues, exceeding those of some of the States of Europe, springing up. It is more likely that an intermediate class

of companies will be called into existence, holding a position between that of the great corporate bodies established in the last and early in the present century, and the humble Friendly Society with which the working classes are familiar. If this supposition be well founded, or if it be admitted that Life Assurance will rapidly extend itself among all classes of the people, it is evident that the rate of mortality among the assuring classes must gradually approximate to that of the country generally.

No principle in vital statistics is better established than the widely-differing rates of mortality among different classes and ranks of society, and the more that assurances are confined to individual classes the more peculiar ought we to expect the rate of mortality to be, but, as the practice of assuring ramifies itself among all classes, so also will the rate of mortality gradually assimilate to that of the country at large; there is consequently reason to conclude that, with the extension of Life Assurance, the rate of mortality will become more favourable.

In support of this statement there is the most abundant evidence.

The past experience of Life Offices, as far as it can be made available in the solution of such a question, shews that the rate of mortality among the assuring classes, which chiefly belong to the middle and upper walks of life, is greater than that of the population at large. See Table H, No. 5, and pp. 39–42.

The corrected experience of the Government male annuitants also shews a higher rate of mortality, and, taking the result of observations on the Peerage as given by Mr. Edmonds and Dr. Guy, the rate of mortality among the highest ranks of society is very much greater than that of the whole population of this country. It will likewise, I have no doubt, be admitted that among the intemperate, the destitute, and the dissolute, the rate of mortality must also exceed the average for the people at large; hence, since all these groups experience a rate of mortality above the average of the whole population, there must be somewhere among the people a class which is subject to less than the average mortality; that class it is evident, from the exhaustive enumeration of the above groups, must be the industrious, provident workmen of our country, who do not fall within any of the other sections of the people just spoken of.

But the following pages contain much direct evidence to shew that the prudential portion of the working classes are really subject to a less rate of mortality.

Early in this century, considerable attention was given to the nature of Friendly Societies or Sickness Clubs, and, since the year 1824, the question of the sickness and mortality to which the members are subject has also engaged public attention, while, since 1835, some evidence of the rate of mortality prevailing among those societies has been before the country, and, for the last ten or eleven years, it is submitted that the present contributions has afforded the most conclusive evidence that the duration of life among the members of Friendly Societies generally is much greater than that of the country at

large, or the select classes dealing with Assurance Companies. Mr. Ratcliffe's investigations into the experience of Odd Fellow Societies, and the more recent inquiry made on behalf of the Government, and described in pp. 440–6, fully support this view of the question.

This immunity from disease among the humble and industrious workmen of the country, whose prudential habits are sufficiently strong to maintain them members of these clubs, is only what *à priori* might be expected. The fact of continuing a member of such a society pre-supposes great regularity of habits, otherwise difficult circumstance and distress would ensue, and, from inability to continue his subscription, non-membership follow. Hence, such a member may be regarded as a type of industry, frugality, regularity of habits, and simplicity of life.

If the health of the body is to be maintained it must co-exist with regularity of habits and uniform physical exercise. The member's avocation enjoin on him a diurnal repetition of the different functions of the body in a manner not required of the pampered, the indolent, the intemperate, and the dissolute. He has, therefore, his legitimate reward in the enjoyment of a long, a useful, and let us hope a happy and blessed life. If the operations of Life Assurance Companies should ever extend so as to embrace the classes now comprising the Friendly Societies, it is evident that the rate of mortality must diminish rather than increase; but should the practice of assuring lives stop short of that, it is still obvious that the same principle will hold good, although the improvement in health may not increase to the same degree.

Having dwelt at so much length on the nature and extent of the data now chiefly in use for the purpose of Life Assurance, it may not be out of place to point to an immense field in Vital Statistics which still remains uncultivated.

One of the most obvious which yet remains untouched, so far as the middle and wealthier classes are concerned, is the mortality of children. Private monographs I know exist on this question, but they are not yet available for public use; the following questions are of great importance to the actuary, not only in the more ordinary exercise of his functions but also in the special cases on which his advice is frequently sought by the public.

The influence of age at marriage on the fruitfulness of the marriage.

The influence of age at marriage on the mortality of children born therefrom.

The influence of age at marriage on the sex of issue, and also on the relative mortality of the first, second, and third born, as well as on each subsequent birth in consecutive order.

The probability of marriage in different ranks of life for each age and sex is also important to be determined; but one of the questions in which the actuary should be most interested, and for which he is but indifferently prepared at present, is that of the tests which should be applied to members seeking admission into an Assurance Society.

The very mention of this subject opens up to view a most fertile field of inquiry, almost entirely neglected even by the Medical Profession itself. Among more obvious questions may be mentioned the power of diseases usually called hereditary in developing themselves in succeeding generations of families in which they have once appeared.

The relation of mortality in general in one generation to that of the next generation.

Relation of the mortality in one section of a family to that of another or surviving section of a family.

The probability of the development of infantile and other non-recurrent diseases in relation to age.

The influence of infantile diseases on the mortality of survivors to mature life.

The practical importance of the preceding questions must be evident to those of even the most limited experience.

At present nothing but arbitrary tests exist, and, consequently, all the absurdities of caprice, instability, and prejudice, interpose in the place which should be occupied by the science, judgment, and disciplined skill of the actuary.

To obtain this amount of new data will involve great expense, much labour and patience, still abundant materials exist to afford the information required, and all that is needed is a resolute attempt to conquer the difficulties, but it is too much to expect that private individuals can afford to go to the expense of collecting materials for the purpose of enriching public companies, already plethoric in wealth, and whose speculations have been notoriously profitable in the history of trading enterprise. On this subject see the concluding paragraph in page 144.

The proper parties to bear the expense are the companies themselves. A few thousands out of the millions possessed by the assurance companies devoted to the acquisition of accurate data on the subject discussed would form one of the wisest and best investments which they could devise, and place their actuaries in the proper position of having to deal with facts and established principles, instead of the dogmas of prejudice and ignorance.

It may on first view occasion some surprise to find a Paper on Criminal Statistics in a work purporting to be Contributions to Vital Statistics, but I have no doubt a careful perusal of pp. 302–407 will satisfy any inquirer that every proper investigation into the state of crime of a country involves the consideration of so many of the most important elements of its vital statistics that the one branch of study necessarily includes the other. On examination of the large body of facts contained in this Paper, and the mode in which they have been treated, it will be found that the minuteness of detail into which it has been necessary to enter for the proper determination of the duration of life in various classes in the community, is even still more necessary for solving the different questions brought under discussion in regard to the prevalence of crime; in fact, until proper adjustments and corrections have been made on account of differences in the distribution

of the population according to age in different districts and communities, there is no possibility of arriving at correct views as to the relative tendency to crime in different districts of the country. As the population of every district is constantly undergoing changes in these conditions, such corrections are equally necessary, in order to determine whether crime be increasing or decreasing within given periods, either in the whole kingdom or in particular parts of it. An examination of the facts given in pp. 302–25, and in Table VII, page 322, shews, that if the tendency to crime had remained constant the distribution of the population of England and Wales, as in 1820, would give a ratio of *one* person in 365 of the whole male population being committed for crime in the course of the year; but, in 1841, the ratio would be *one* in 339; but by the census of 1851, the ratio would be also one in 339. Again, it will be found that between different districts of the country no correct comparison can be made unless such corrections be in the first place carried out. Otherwise it would appear that, on the assumption of the same tendency to crime existing there would, owing to differences in the distribution of the population, in one district of the metropolis, Bethnal Green, for example, be the ratio of *one* committed in 338 of the population, and in St. George's, Hanover Square, *one* in 280. Again, in Anglesea, Cardigan, Carmarthen, Dorset, Merioneth, Montgomery, and Pembroke, the ratio is *one* in every 360 of the male population; while in Glamorgan, Lancaster, Middlesex, and Monmouth, the same tendency would produce as high an average as from *one* in 325 to *one* in 315. This question is fully discussed throughout the Paper, and some striking examples given of the facilities afforded by attention to this element of the investigation while interrogating other features in the development of crime. The necessity for this correction arises from the fact that the tendency to crime at one period of active life is in both sexes more than quadruple that at another term of life, and also that the ratio of crime in the male sex is nearly five times as great as in the female sex, and, consequently, different ratios of the two sexes, and also differences in the distribution of the numbers of either sex, according to age, in different localities will produce apparent differences in the ratio of crime, when viewed, as is usual, in regard to the aggregate of the population only, although the actual tendency to crime at corresponding ages in the respective sexes may be precisely the same.

On referring to pp. 325–6, a curious law is disclosed as regulating the development of the aggregate crime at various ages. This law, if attentively considered, is calculated to throw much light on the progress of crime; but an examination of the analysis made of the tendency to specific forms of crime, in pp. 391–8, will shew how remarkably different is the law which regulates the tendency to particular forms of crime at different ages, and how unsuccessful all preventive measures must be unless an accurate knowledge exists of the particular tendencies to certain propensities and forms of crime at the different terms of life.

During the last quarter of a century much has been said and written, particularly in this country, and in France, on the statistical evidence which affects the relation between education and crime, and the very opposite conclusions arrived at by different inquirers it is submitted are quite reconciled by the more complete and accurate mode of investigation explained and followed out in pp. 353–91. If the crime which has hitherto prevailed in the various districts and groups of counties be analysed in the manner pointed out, so that the groups compared differ in respect of education only, it will be found that out of twenty-two different combinations formed of all the different districts of England and Wales, that in every instance there is an excess of crime where there is the least education or instruction, and comparing the respective sections of each group of counties, it will be found that there is an average excess of 25 per cent. of crime in the sections of inferior education over those of higher education, while in some districts the excess is as much as 44 per cent. These results, it will be seen, are derived from the application of the educational test to the general population of the district in which the crime is investigated; but the same contribution also shews that invariably in those districts in which there is an increased amount of crime there is likewise a higher ratio of uneducated criminals, and in the less criminal districts a smaller proportion of the criminal population is found to be wholly destitute of the rudest elements of education, and, continuing to trace the details of this investigation, there is found the following very remarkable combination of elements in the manifestation of crime.

The districts of the country in which the general population is the worst educated, the districts in which the greatest amount of crime prevails, and the districts in which there is the highest proportion of uninstructed criminals, are constantly found assimilating; while, on the other hand, those districts which are the best educated, the least criminal, and in which shews a smaller proportion of uneducated criminals, are likewise found to be identified in the various combinations.

It is hence obvious that the very small amount of education, or rather instruction, implied by the test employed in the following investigation, must have a powerful influence on the criminal calendar of the country, and a great reduction of crime may be therefore justly expected from a more general diffusion of education.

It may not be altogether out of place to remark here, that if the term education be held to signify the culture and elevation of the moral character, it is evident that its immediate and essential influence would be to destroy crime; in fact, in this sense, education and freedom from crime must bear the relation of cause and effect; and therefore, when education is at a maximum crime must, of necessity, be at a minimum; so that, if the term be thus explained, statistical evidence would be *à priori* unnecessary to solve the problem proposed: but if the term education be used in its ordinary acceptation, merely to imply instruction, it then becomes a fit and proper question,

whether education in this restricted sense has any influence on the repression of crime.

The educational tests employed in the following Contribution are fully explained in pp. 353 and 377, and it is believed that a careful perusal of the whole of the Paper on the Statistics of Crime, and the methods of investigation followed will, in the results arrived at, surprise even the best informed readers in finding so low a test of education or instruction as that employed to lead to so striking differences in the criminal condition of various districts of the kingdom. These results are, in every instance, so constant and positive as fully to establish the conclusion that education is one of the most powerful preventives of crime. Whatever other combinations may be attempted or made in the analysis, of which a great number will be found in connection with the manufacturing and agricultural condition of the various counties, no solution is arrived at as to what is the element or feature which produces in one great community an excess of fifty-two per cent. of crime, and in another reduces crime thirty-three per cent. below the average, but introduce the educational test and the whole problem is completely solved.

Immense correctional efforts are at the present time made in the shape of reformatories, and other institutions for the treatment of convicted criminals, but little or nothing is done to remove the causes of crime; and if it be admitted, as it is presumed from the evidence adduced in the following contribution, that education is the most powerful agent yet known in counteracting the criminal tendencies of the population, it becomes a question of vital importance for the Legislature to decide whether some more complete system of education, which would reach and saturate the whole juvenile population, should not be speedily devised. The country exercises the right of punishing crime, and it is a fair question for consideration whether it should not also recognise the duty and responsibility of removing some of the causes of crime. In the following paper it will be found that to one class of offences—those against property, committed without violence—are due three-fourths of the whole crime of this country; and, among the population of sixteen years of age and under, more than nine-tenths of all their crimes belong to this single class of offences. A few minutes reflection is enough to shew how soon a general and amply-developed system of education would tell on that portion of the rising population, who without it must soon swell the criminal calendar of the country.

The Contribution on the Statistics of Crime in England and Wales contains many other curious and important points of inquiry, and gives an analytical view of the Criminal Returns of this country for the twenty years 1836–55; and in pp. 403–7 will be found a condensed recapitulation of the general results of the investigation.

An examination of the course of inquiry pursued will lead every one seriously interested in the moral condition of the country to view with pain and regret the present most defective character of the Home Office Returns; in fact, for all statistical purposes

they are now worse than useless. They cannot, it will be found for reasons hereafter advanced, be employed in any exact inquiry. Ever since the year 1839 these Returns have been periodically undergoing such changes, and have been from time to time presented to the public in so defective a shape, that in the hands of unskilful persons they are likely to lead to the most erroneous and fatal conclusions.

At a time when throughout the whole civilised world the most strenuous efforts are being made, not only by individuals but by Governments, to systematise the records of all facts and phenomena bearing on the social and moral progress and happiness of the people, it is lamentable to find our own Home Office Returns in so retrogressive a condition as that pointed out in the commentaries in pp. 398–400.

It is believed that the elaborate analysis of Railway Accidents, given in pp. 230–301, for the period commencing the 1st of January, 1840, and ending 31st of December, 1856, if carefully studied by those entrusted with the details of railway management, would soon lead to many improvements which would speedily effect a great reduction in the number and severity of the accidents.

This Contribution cannot however fail to shew how erroneous the general impression on the public mind is in regard to the dangers of railway travelling, and more particularly so as regards the indiscriminate blame to be attached to the system of railway management.

The Paper contains evidence not only of a great diminution of all kinds of accidents, but, what is exceedingly satisfactory, of those accidents which are due to causes assumed to be under the control of the Companies. It is shewn, that while deaths from causes beyond control of the Companies have in the more recent years diminished in the ratio of 49 to 30, those from causes under control of the Companies have diminished in the ratio of 64 to 19. This result is certainly one not generally understood by the public, for not only are all railway accidents supposed to be very much on the increase, but those due to details of management are believed to be rapidly and alarmingly so. The facts of the case, however, do not support this view, for they disclose the truth that railway management, so far as accidents producing death are concerned, has greatly improved. Whether this change be due to the better general regulations enforced by the Directors of the Companies, or to the improved skill and intelligence of their officers and servants, still the results of the investigation afford the most striking testimony to the recent improvement and increased safety in railway travelling, and encourage the hope that the same means will be persevered in to effect a still further reduction in the frequency and intensity of railway accidents.

It has been said that the great bulk of accidents is due to collisions, but an inspection of Table XXI, page 257, will shew that they constitute the causes of 22·5 per cent. only of the whole deaths amongst passengers, and if the deaths of employés be included,

not quite one-fifteenth part of all the deaths are occasioned by collisions. An examination of the figures in Abstract L, page 261, will shew that the deaths of passengers from collisions at stations have in recent years decreased to about 58 per cent. of their ratio in earlier periods, and those from collisions elsewhere than at stations have been reduced to 25 per cent. of their original amount.

It is, however, most lamentable to learn, that of 174 collisions of which the causes are classified in Table XXII, page 263, no less than 104 have arisen out of what can be described as nothing short of the most culpable neglect. The facts recorded in that Table are of great importance, and although the Directors of Railway Companies have in recent years done an immense deal to protect passengers against loss of life and limb, they are still imperatively called on to take the subject of the frequently recurring collisions more thoroughly into consideration. When such most culpable neglect exists, as is evident by the facts disclosed in pp. 263–4, the public have a right to demand more complete protection. Much interesting information will be found in pp. 261–73 in regard to collisions and the manner in which passengers are affected by them.

The other important kinds of accidents from which passengers suffer, and which are assumed to be under the control or management of the Companies are those occasioned by trains or portions of trains running off the line. It will be found that they occasion 32·1 per cent. of all the deaths of passengers from defined causes. In fact, "collisions" and "running off the line" have caused 91 per cent. of all the deaths of passengers for which the Companies can be supposed responsible.

On referring to Table XXIX, page 276, a strange circumstance is observable. From the 51 cases of trains, or parts of trains, or engines "running off the line," occasioned by the state of the weather or machinery breaking, not a single death of a passenger happened, while the 30 cases of "running off the line," owing to the defects in the permanent way, produced eight deaths of passengers.

In regard to the collisions which have taken place from defects and breakage of machinery, the case is however unfortunately very different, for 34 collisions, attributable to this cause, occasioned as many as eleven deaths of passengers, and no less than 208 serious injuries. The causes of these are certainly, to a very great extent, completely under the control of the Companies. Of these 34 collisions, the great bulk was absolutely preventable by a sufficient amount of care. For example, an examination of Table XXII will shew that no less than fifteen are due to portions of the train becoming detached, and three to defective "breaks," and it is difficult to conceive any sufficient reason to justify a continuance or repetition of accidents from these causes. No doubt the coupling of carriages may, under extraordinary circumstances, be found to give way, even when great vigilance has been used; but such an excuse can be of no avail in the face of so many accidents of this kind, and there certainly does appear strong reason to

condemn the system of management which permits a series of collisions from such causes. In the same Table it will likewise be found that sixteen collisions actually took place owing to trains having been retarded by accidents to some portion or other of the engine. It is no doubt sometimes difficult to determine on inspection the defects in the mechanism of an engine, still the collisions from this cause have been so many that it is impossible to conceive that a due amount of scrutiny has been always exercised in the examination of the state of the locomotives. Defects and breakage of machinery have caused, either by "collisions" or "running off the line," as many as seventy-seven accidents, which have resulted in thirty-seven deaths to passengers and employés, and the large number of 273 serious injuries. Frequent inspection by competent parties is the protection against this group of accidents, and strong measures should be enforced to secure the safety arising from proper supervision.

Of the 308 collisions recorded in Table XXVII, page 272, no less than 110 have taken place at stations, or the very places where the greatest care and vigilance are required, and might be exercised. Anything like fair attention to the use of well understood precautions, and a proper employment of signals and telegraphs, should completely, or at all events to a great extent, remove this class of accidents.

The latter portion of the Contribution on Railway Accidents, pp. 278–301, merits deep and serious consideration owing to the results exhibited of the frightful amount of accidents and fearful loss of life to which the servants of Railway Companies are exposed. The facts contained in that portion of the Paper are of a very curious and certainly of a very striking nature, and must enlist, on behalf of the more important class of railway employés, the sympathies of all who may give those pages a careful consideration.

In pp. 93–9 are given several important facts relating to the Registration Act for Scotland, the 17th and 18th Vic., cap. 80, and illustrations furnished of the schedules and certificates proposed for use under that Act. During the year 1855, the first year in which the provisions of the Act were in operation, the complete schedules as contained in the Act were employed by the various Registrars, but since the beginning of 1856, those forms have been thrown aside, and schedules substituted which are scarcely more complete than the very meagre and defective forms now employed under the English Registration Act. This change is very much to be regretted, for any thing short of the original requirements of the Act cannot possibly supply the information so much needed for the legal purposes of the country, and demanded by the present state of statistical science.

The reasons assigned for making the change is the difficulty said to exist in procuring from all parties the full amount of information required by the Act, but it is very much to be feared that on this ground there is not sufficient justification for the alteration which has

been made. In page 99 *seq.* the probability of this difficulty arising was anticipated, and it was suggested that in Scotland, where no National Registration previously existed, the people would need, during the first few years of the operation of the Act, to be instructed as to the precise kind of information to be furnished in the event of a birth, death, or marriage. Had this been properly attempted and persevered in for three or four years no more difficulty could have been experienced in carrying out the original complete system of Registration than the present very defective one which has been substituted for it. Some influential member of the Government, it is hoped, will speedily take steps to cause the forms prescribed under the Act to be resumed, and their use may, in that event, before long be extended to England.

The Contributions on the Rate of Mortality in the Medical Profession, the Mortality of Master Mariners, and the Mortality among Persons of Intemperate Habits, contain many interesting results not appearing in any other Papers on Vital Statistics. In the latter of these there is a somewhat unexpected coincidence pointed out in page 225, in the remarkable similarity between the proportion of crime in the sexes to the proportion of deaths from assigned causes of intemperance. This question is worth further investigation, but not falling strictly within the scope of the present Contributions the inquiry has not been entered upon at much length.

Those interested in the management of Friendly, Benefit, and other kindred Provident Societies will find a large amount of information in regard to them in the following contributions.

The laws of sickness and mortality, as observed in the experience of these societies, are fully discussed in pp. 17–82, 160–4, and 408–68, and a great variety of data furnished, shewing the influence of trades, occupations, and local peculiarities on health. In the thirteenth edition of "Odd Fellow and Friendly Societies," published in the year 1851, it was stated that one of the most important questions which appeared to have engaged the attention of the recent Parliamentary Committees on Friendly Societies, was the sufficiency, for the purposes of Odd Fellow Lodges, of the data brought before the public in the first and second editions of this work—several of the witnesses examined contending that these lodges were exempt from much of the sickness to which Friendly Societies in general were subject: however, all doubts on this question have been removed by the publication of the rate of sickness actually experienced by the "Manchester Unity," and the results, it will be found from the analysis of them, given in pp. 423–8, *seq.*, confirm in a most remarkable manner the law of sickness developed in these Contributions. A striking practical illustration of this fact will be found by comparing the financial results of both sections of Table AX, page 496, deduced from the actual experience of the Order, with the corresponding results in Tables AR and AS,

pp. 479–80, which are based on the data originally appearing in these Contributions. The very remarkable agreement of these two classes of results, considering the data to have been collected from very different sources and by means quite independent of each other, must be exceedingly satisfactory to those interested in the progress of these institutions. It is understood to be the intention of the Manchester Unity, to make a further inquiry into the nature and amount of the sickness which prevails in the Order, and with this view the various lodges will be required to make the necessary returns of their experience, at the expiration of the next quinquennium, the end of the year 1860, and until then nothing further will be known of the ratio of sickness to which the great body of the Odd Fellows is subject. The analysis of the facts, already referred to, however, pretty conclusively shews, that whatever may be the experience of individual lodges they have, taking them in the aggregate, no immunity from the sickness hitherto indicated as characteristic of Benefit Societies in general, and a perusal of the various Quarterly and Annual Reports of the Unity, distinctly shews this to be now the opinion of most of the best informed members of the Order.

Attention is particularly directed to the observations and facts in pp. 440–6, on the Government Analysis of the sickness experienced by Friendly Societies during the quinquennium 1846–50, and printed in Parliamentary Papers No. 955 of 1853, and No. 506 of the year 1854. Since the disastrous publication of the Highland Society's Tables in 1824 perhaps no other so unfortunate event as the publication of what is termed the Government Tables has arisen in the history of Benefit and Friendly Societies, and into the nature of the mischief likely to be occasioned by it, I have fully entered in the pages already referred to. A careful perusal of those observations must satisfy every one, having a practical knowledge of the management of Friendly Societies, of the imminent danger of circulating such documents under Government sanction. If those entrusted with the Analysis of the Government Sickness Returns had but asked themselves the simple question—What is the true object of a Friendly Society? it is impossible they could have excluded from their analysis "chronic ailment," "mere decrepitude," "slight paralysis," "blindness," "mental disorder," and "senile infirmity," and have only included in the published results, presented for the guidance of Friendly Societies in the country, "sickness incapacitating from labour, *requiring constant medical treatment*, and of *limited* "*duration*." The object which a working man has in view, in joining a Benefit Society, is not only to provide for sickness of *limited duration*, *requiring constant medical treatment.* If this were the only purpose of Friendly Societies, they would be nothing more than a delusion and a curse to a provident working man. Against sickness of *limited duration*, men, whose prudential habits are sufficiently strong to retain their membership in Friendly Societies for two or three years, can, with a struggle, make provision even without the aid of a society; but how many working men can contend against the vicissitudes of any

description of "*chronic malady*," or protracted sickness? The true object and mission of Friendly Societies, when properly considered and as regarded by the working man himself, is to afford him a competent support and complete independence during periods of sickness, incapacity, and disease, however protracted; and it is to accomplish this object that not only the earliest but the most recently and best organized societies make special provision. Their object is not to form a stepping stone, to aid the industrious and prudent to pass from the active and manly independence of their days of vigorous labour, to the degraded pauperism of the Workhouse. Were Friendly Societies so constituted, they would be a disgrace to the country, and could never receive the support and sympathy of the people.

This is however the only practical effect which the general dissemination of the two Parliamentary Papers referred to can have, for by causing Friendly Societies to adopt scales of contributions and benefits, which make no provision for those very vicissitudes which are in fact the most trying to a member's independence, he is, at a time when the least prepared for it, declared off the funds of the Society, and has of course no alternative but to take shelter under the roof of the Workhouse. That this is the real direction and tendency of these Parliamentary Papers is fully shewn, in the Appendix to the First Report of the Registrar of Friendly Societies in England and Wales, dated the 18th July, 1856, and ordered by the House of Commons to be printed 21st July, 1856. The portion of the Appendix in question commences in page 37, and is entitled "Suggestions "by John Tidd Pratt, Esq., the Registrar of Friendly Societies in England, for the "establishment of Friendly Societies; with Tables of Contributions for payments in "sickness, &c."

In page 39, he states that "Provision should be made, in the Rules, that nothing "but sickness incapacitating from labour, and requiring constant medical treatment, and "of limited duration, as contradistinguished from chronic ailments and mere decrepitude,— "should be provided for, and that slight paralysis, blindness, mental disorder, or senile "infirmity should not entitle a member to sick-relief from his society." And again, at page 48, it is stated that the Tables "are not intended to meet the case of chronic "infirmity demanding little or no medical attention."

This is certainly a most extraordinary suggestion to come from one holding an appointment of so high pretensions. It would be interesting to know the Registrar's views of what the establishment of a Friendly Society is meant by him to effect. It surely cannot be his object to work out a mere problem in medical science, in order to determine the relation between acute and chronic diseases; and still looking at his suggestions in the most favourable light it is possible to regard them, no one can conclude that there is any intention to make Benefit Societies self-supporting Provident Institutions, which shall, during the physical vicissitudes to which all flesh is heir to, render their members

independent of the Parish and the Workhouse. A distinct provision is suggested to be made in the Rules to prevent members from receiving any relief during "chronic "infirmity demanding little or no medical attention." Admitting, therefore, that it is quite possible for the members of a society to discriminate between cases of "chronic "ailment and infirmity," in a way to effectually prevent litigation with sickness claimants, let us see what would be, under such circumstances, the position of the members of a society formed on the model recommended by the Registrar. On referring to pp. 445–9, *seq.*, a considerable amount of data will be found, shewing the ratio of protracted sickness to sickness generally: after the age of 40, it will be seen from Table NN, page 446, that the ratio of the number of persons suffering from protracted sickness to the total number of persons actually sick increases very rapidly, and during the term of life 41–70, the average ratio is as high as 14·5 per cent., the shortest duration of any one attack of such protracted sickness being one year, while many of them are of course of several years' duration. In the decennium of life, ages 61–70, the cases of protracted sickness extend to nearly 48 per cent. of the whole number. In the Appendix to Mr. Ratcliffe's Report, already referred to, and published with the Quarterly Report of the G.M. and Board of Directors, for January 1853, will be found some valuable information on this question; but the form in which the results are presented by Mr. Ratcliffe, does not shew the number of members subject to protracted sickness, but simply the average amount of that sickness to all the members of the lodges over which the observations extend.

Ages.	AVERAGE SICKNESS PER MEMBER EXPERIENCED							Ages.
	Within the first 12 months.	Within the second 12 months. (*a*)	After the second 12 months. (*b*)	Table Z, p. 424. Total, whether of short or long duration. (*c*)	Ratio of (*a*) to (*c*)	Ratio of (*b*) to (*c*)	Ratio of (*a*)+(*b*) to (*c*)	
18	·5030	·0018	·0000	·5048	·3566	·0000	·3566	18
23	·6677	·0204	·0160	·7046	2·8952	2·2708	5·1660	23
28	·7081	·0293	·0276	·7652	3·8291	3·6069	7·4360	28
33	·7579	·0492	·0542	·8607	5·7163	6·2972	12·0135	33
38	·8373	·0594	·0814	·9783	6·0718	8·3205	14·3923	38
43	·9963	·1070	·1240	1·2274	8·7176	10·1026	18·8202	43
48	1·2101	·1616	·2530	1·6249	9·9452	15·5702	25·5154	48
53	1·2882	·3311	·5764	2·1959	15·0781	26·2489	41·3270	53
58	1·7900	·5628	1·1111	3·4839	16·1543	31·8924	48·0467	58
63	2·7253	1·1421	1·8972	5·7655	19·8092	32·9061	52·7153	63
68	3·1666	1·3142	2·4712	6·9265	18·9735	35·6775	54·6510	68

It will thus be seen, that the average amount of sickness, in column (3) of this abstract, experienced within the second twelve months of sickness, ranges from 2·8952

per cent. to 19·8092 per cent. of the total sickness to which the members are liable; and the average amount of sickness, in column (4) experienced after the second twelve months' illness, varies from 2·2708 per cent. to 35·6775 per cent. of the total sickness; the ratio of protracted sickness to the whole amount of sickness, in both columns, increasing with advance of age, as shewn in columns (6) and (7). If attention be now given to the results of column (8) of the preceding abstract, they will be found to throw considerable light on the painful condition in which those societies which, following the advice of the Registrar, adopt the Government Tables, must be placed. It will be there seen, that the protracted sickness varies from 5·1660 per cent., of the total sickness, at age twenty-three, to 54·6510 per cent., at age sixty-eight. These results, with those already quoted from Table NN, page 446, shew abundantly the serious defects in the Government Analysis. But it may be still important to refer to Table QQ, page 448, in which will be found some curious information on the relation of permanent to temporary sickness under various forms of disease, and it will be found that in Class IV, Diseases of the Brain and Nervous System, there is the highest ratio of permanent and protracted sickness; and viewing that fact in connection with the results in Table XIV, page 182, and the Abstract in page 183, it will be seen that after the age of 40, this class of diseases grows rapidly in intensity, and hence the frequency with which, after that time of life, members of Friendly Societies will become claimants for permanent and protracted sickness.

The question now arises, what are the members belonging to those societies, formed in accordance with the advice of the Registrar of Friendly Societies, to do while suffering from this protracted or "chronic" sickness? They can get no relief from the society, and in his Report and in its Appendix of Suggestions, not a single syllable is written on the subject, in fact all allusion to this important feature is carefully avoided; and from pp. 444–5, *seq.*, it will also be found that in the published Analysis of the Government Returns themselves, the nature and extent of the "chronic ailment and mere decrepitude" are nowhere given, so that so far as those documents and the Registrar's instructions are concerned, the promoters, and those interested in the management of Friendly Societies, have no choice, but to follow implicitly the Government Tables, and permit about one member in seven, of the sickness claimants, above the age of forty, to be drafted to the Workhouse. Had the eliminated elements, in question, been given as a separate and distinct series of results, data would have been available for societies to make the necessary provision for "chronic ailment and mere decrepitude;" but nothing of the kind has been done. It is therefore hoped, that all interested in Friendly Societies will soon become fully aware of the defective and most disastrous aspect under which the results of the Government Analysis of Sickness has been submitted to the public.

I have elsewhere shewn, that any one giving attention to the examination of the different witnesses, before the recent Parliamentary Committees, must have observed a

strong tendency, on the part of the members, towards the adoption of Model Tables of Rates of Contributions and Benefits. In Appendix (A) to the Report by the late Lord Beaumont's Committee, House of Lords, Session 1847–8, paper No. 126, I have furnished some striking illustrations of the varying liabilities to which different societies are subject; but the additional examples, now furnished in pp. 408–530, are certainly very curious and remarkable, both in a scientific and practical point of view, and conclusively prove that few things could be more dangerous to the interests of Friendly Societies, than the adoption of Model Tables. There is nothing connected with the study of a statist and the profession of an actuary, requiring more judgment and experience, than the proper discharge of the duties devolving on him in giving advice to Benefit Societies, and every day shews more clearly, that the circumstances in which different societies are placed, are so dissimilar as to render the liabilities of one, no criterion for those of another.

The members of Benefit Clubs and Odd Fellows' Lodges, should give serious consideration to pp. 513–21, *seq.*, on a point of much importance in the formation and management of these societies. Little has yet been done to urge the necessity of every one of these clubs or lodges having a sufficient number of members to realize an average ratio of sickness and mortality; but the facts and illustrations, given in the following pages, will, it is hoped, lead to more generally correct views and better practical managements in this respect.

Much is said in the following pages, on the subject of Odd Fellow Societies, and what is written gives a faithful and accurate representation of the state of the order, at the time the 13th edition of "Observations on Odd Fellow and Friendly Societies" appeared. Since that time, important changes have taken place in the government and management of the lodges, although but little alteration in their financial condition, and it is, however, right that these financial improvements should be pointed out.

At the A.M.C., held at Preston, in May 1853, a new scale of initiation and an increased ratio of contribution was adopted, for all members admitted into the Unity after the 1st August, 1853. The following is the 145th general law then adopted and still in force in the Order:—

"That no person of improper character, nor any one under the age of 18 years shall be made a member of this order, *or any person be allowed to be a member of two lodges in the Unity.* Any member who proposes a person contrary to this law shall be liable to be fined twenty-one shillings, and not less than ten shillings and six-pence, whether the person proposed be admitted or not. The charges for initiation to be as follows:

			£.	s.	d.
18	and not exceeding	24	0	5	0
24	„	27	0	7	6
27	„	30	0	10	0
30	„	32	0	15	0
32	„	36	1	0	0

And every member initiated, in accordance with the above scale, shall pay the following annual payment or contributions in addition to the usual contributions paid by other members.

				£.	s.	d.
18	*and not exceeding*	22,	*additional annual Contribution*	0	0	0
22	,,	24	,,	0	0	6
24	,,	27	,,	0	2	0
27	,,	30	,,	0	3	4
30	,,	32	,,	0	4	3
32	,,	33	,,	0	4	5
33	,,	34	,,	0	5	8
34	,,	35	,,	0	6	7
35	,,	36	,,	0	7	6

And districts shall have discretionary power to admit persons above 36 years of age, *upon payment of* £.1, *and the yearly contributions of the lodge, together with the additional annual payment of* 7*s.* 6*d. for each and every year* the age of the person proposed exceeds 36 years. Deaf and dumb persons may be admitted members of the Order."

The consequence of the adoption of this general law is that all members admitted after the 1st of August, 1853, shall, in order to be entitled to the benefits specified in page 498, *seq.* and which may be fairly said to represent the average amount of benefits provided for by the members of the Unity, namely, an allowance of 10*s.* per week during sickness, a payment of £.10 at the death of a member, and £.5 at the death of a member's wife, have to contribute according to the following scale:—

Age at Entrance.	Yearly Contribution = (*a*)	Initiation Fee = (*b*)	Equivalent Annual Contribution.
	£. s. d.	£. s. d.	£. s. d.
18	1 1 8	0 5 0	1 1 11
19			1 1 11
20			1 1 11
21			1 1 11
22	1 2 2		1 2 5
23			1 2 5
24	1 3 10	0 7 6	1 4 2
25			1 4 2
26			1 4 2
27	1 4 11	0 10 0	1 5 5
28			1 5 5
29			1 5 5
30	1 6 0	0 15 0	1 6 9
31			1 6 9
32	1 8 2	1 0 0	1 7 0
33			1 9 3
34	1 9 3		1 10 4
35			1 10 4

That the effect of the admission of future members into the Order on this scale may be fully seen, and the extent to which the observations made in pp. 497–529, *seq.* will be thereby modified, let a parallel case to that discussed in page 498 be considered. It is there shewn that, according to the data furnished by Mr. Ratcliffe in his very able and valuable report, and deduced from the actual experience of the Manchester Unity itself, the contributions which should be paid by members aged thirty-two (which, according to Mr. Ratcliffe's report, was nearly the average age of the members), in order to provide the precise benefits above specified, is the sum of £.1 18*s.* yearly; while the actual amount required by the above table, which represents the rates adopted at the annual meeting held at Preston in 1853 is only £.1 6*s.* and making allowance for the entrance fee of £.1, this contribution is raised to no more than £.1 7*s.* yearly, shewing, even according to the actual experience of the Order, an annual deficit on each member's contributions of no less than 11*s.* or, in other words, the scale of contributions in the Preston table would need to be augmented upwards of *forty* per cent. to fully provide for the benefits promised to the members of the Unity.

It will also be seen from page 498 *seq.* that the contributions according to scale No. 1, as prepared by the Board of Directors for the use of lodges in the Unity, and which is still applicable to all the existing members who have been admitted prior to August 1853, quivalent to £.1 2*s.* 9*d.* annually, to provide the same benefits; and, consequently, that scale requires an increase of 15*s.* 3*d.* yearly, or about an addition of sixty-seven per cent. to render their contributions commensurate with the benefits promised to this class of the members, who, at the commencement of that year were good on the books, numbered no less than 230,226. It is here evident that so far as all the older members are concerned, the relation of their contributions and benefits remains unaltered from the state of things represented in the following pages. It has, however, just been shewn that the New Scale of Contributions for age thirty-two exhibits an annual deficit of *forty* per cent. From data, however, which will be immediately presented, it appears that the average age of the members admitted to the Unity during the triennium 1853–5, was twenty-three years, and at this age, according to Mr. Ratcliffe's data, derived from the experience of the Order itself, and developed in Table Z, page 424, and Tables AU, AV, AW, and AX, pp. 494–6, *seq.* it will be found that the annual contributions required for the benefits already specified is the sum of £.1 8*s.* 6*d.* while that according to the Preston Table, after making allowance for the value of the Initiation or Entrance Fee, is only £.1 2*s.* 4½*d.* being a deficiency of 6*s.* 1½*d.* yearly; and, therefore, to make the table at that age self-supporting, the yearly payment would require to be increased upwards of twenty-seven per cent. To this extent will the contributions of all present and future members admitted under the Preston scales be deficient, while the contributions of all those admitted prior to August 1853 will be deficient to the alarming extent of sixty-seven per cent.

It is impossible, with any shew of reason, to deny these conclusions. They are derived directly from the experience of the Manchester Unity itself; but had I quoted from my own previously published data, as appearing in the other tables of this contribution, and already fully discussed, results almost precisely similar would have been obtained. There are few researches in the domain of vital statistics in which two independent investigations in different fields of inquiry have produced results so strikingly confirmatory of each other.

It may be important to shew for quinquennial ages the relation between the two scales now mentioned, and the rates deducible from the experience of the Order, which are necessary to provide the same benefits.

Age.	Yearly Contributions now required from Members who entered the Unity		
	Prior to August, 1853.	Since August, 1853.	Required according to the Experience of the Unity for all Members, see pp. 494-8.
	£. s. d.	£. s. d.	£. s. d.
20	1 1 8	1 1 8	1 6 2
25	1 1 8	1 3 10	1 10 2
30	1 1 8	1 6 0	1 15 5
35	1 1 8	1 9 3	2 2 5

An examination of the preceding figures will satisfactorily shew the manner in which the financial resolutions of the Preston A. M. C. will affect the condition of the Order. Unless an immense number of the older class of members should secede from the Unity, and relieve it of their liabilities, it is undeniable that the deficit pointed out in the earlier editions of this work, and fully explained in pp. 497–514, may still be held as fairly representing the perilous condition of the Manchester Unity, even at this time.

I have good reason for knowing, that it is not the opinion of the best informed members and officers of the Order, that the scale adopted at the annual meeting at Preston, in the year 1853, is high enough in its terms to provide the benefits promised under it, but it is, no doubt, as may be seen in the preceding illustrations, an improvement on those previously in use by the Manchester Unity. The fact is, as shewn in pp. 503 and 505, the Board of Management has struggled for years with the question, and are unable suddenly to carry out a thoroughly sound and amply developed system of financial reform, and looking at all the circumstances of the case, this is scarcely to be wondered at.

There can be no question whatever, that notwithstanding the recent changes effected by the Preston table, the rates and contributions required of the members are still entirely

inadequate to provide the benefits promised, and, unless some very marked improvement be made in the adjustment of benefits and contributions, the Manchester Unity can never become a great and useful provident institution. If its present scheme does not undergo such modifications as have been clearly shewn to be necessary by its own data and experience, the Unity must either speedily disappear, or continue in the unsettled, unsatisfactory, and unstable condition in which it has been for the last ten or twelve years. An examination of the Quarterly Reports of the G. M. and Board of Directors shews that in the triennium 1853–5, no less than 47,274 new members entered the Unity. This should act as a warning. The directors, as stated in page 502, *seq.* remark in one of their reports, "That the amount of initiation money received from members in 1844, being no less a "sum than £.49,382, it will be observed, on reference to the list of lodges, that our increase "of members in that year was only 21,461, and by these returns, it is clearly proved that "upwards of 40,000 members were initiated in 1844, thereby at once affirming that "upwards of 20,000 members left the Order in one year, after paying their initiation "money and contributions for a length of time. We are of opinion that the particular "attention of the members of the Order should be drawn to this important fact, with a "view of arriving at the true cause why so many leave the Order."

It would hence appear that the same lamentable state of things continues, for, notwithstanding the large number of new members joining the association, 47,274 having entered during the three years 1853–5, and, as hereafter shewn, the admissions were in preceding years in even a higher ratio, still the members have not increased since the beginning of 1844. At that date, the number of members is represented in one of the director's reports to be 251,727, and now we find, from the quarterly report for April, 1856, that, at the beginning of that year, the number good on the books was 251,008. This is, perhaps, the very worst circumstance which can be urged against the present state of the Manchester Unity. The influences must be very powerful which have caused so many members of late years to desert the Order in this wholesale manner, and is no doubt one of the reasons why many lodges have augmented their funds even with a scale of contributions, which would, under a normal and less perturbed state of membership, be ruinously low and inadequate. It happens to be within my knowledge, that when valuations of the assets and liabilities of some of the lodges have been made, that although they were found to be charging insufficient contributions for the benefits granted, still they were declared to have a surplus of assets over liabilities, and this fact was accounted for by the great number of members leaving the lodges and sacrificing their initiation money and their contributions for several years.

This fluctuating condition of membership is much to be deplored, and I am afraid it will long continue, unless by a speedy and proper adjustment of the contributions and

benefits, members are led to place greater confidence in the permanence and stability of the Order.

It is also important to contrast the condition of the Unity in respect to the number of members within the twelve years which have elapsed since January 1844, with that of the immediately preceding ten years.

In the year 1834, the number of members in the Unity was about 60,000; in January 1844, it had increased to no less than 251,727, being an absolute increment, after allowing for deaths and withdrawals, of more than 19,000 per annum; but within the last twelve years no increase would appear to have taken place, although these latter years constitute undoubtedly the period of greatest prudential progress in the history of Benefit Societies. It must be admitted, that the gigantic proportions of the Manchester Unity have attracted so much public attention to its affairs, and the question of its stability has, within recent years, been so openly and freely discussed before Parliamentary Committees and elsewhere, that it was impossible for members to repose the same confidence in the safety and permanence of the institution which they willingly lent to it during the earlier period of years.

It is highly important for those taking an interest in this great Friendly Society to understand clearly the nature and extent of the changes going on amongst the members in recent years, and the following succinct Abstract has, from the data furnished in the Quarterly Reports, been prepared for that purpose.

Year.	Members less than Twelve Months in arrear on the first day of the Year.	New Members initiated.	Deaths.	Lodges Suspended for non-compliance.		Lodges Expelled from the Unity.		Lodges Closed, by a Division of Funds.		Lodges Closed by want of Funds, small Number of Members, Failure of Banks, &c. &c.		Lodges Seceded from the Unity.		Lodges Amalgamated with other Lodges.	Number of Members who have ceased to belong to the Unity on their own account.
				Number of Lodges.	Number of Members.	Number of Lodges.	Number of Members.	Number of Lodges.	Number of Members.	Number of Lodges.	Number of Members.	Number of Lodges.	Number of Members.		
1850	*224,878	10335	2189	..	..	1	51	73	1809	..	..	32	1641	30	4846
1851	229,975	10213	2451	18	1012	4	137	34	1324	6	98	23	1637	36	8668
1852	225,194	10712	2565	11	1011	4	225	37	1447	3	47	11	537	16	5581
1853	224,441	16618	2728	11	654	2	144	23	813	18	615	11	654	21	3188
1854	232,228	18836	2768	8	336	1	46	15	539	..	..	..	..	20	6876
1855	240,499	21319	2724	..	..	2	39	9	360	13	157	7	286	19	7244
Total.		88033	15425	48	3013	14	642	191	6292	40	917	84	4755	142	36,403

* Good on the Books only.

It will be seen from the above figures that in six years no less than 88,033 new members entered the Unity. The number of deaths amounted to 15,425, but the large number of 52,022 members seceded from the Order from the various causes assigned

in the preceding Abstract. It has already been stated, that on the 1st of January, 1856, the number of members was 251,008, and from a succeeding Abstract, given in page xxxiii, it will be found that the new members initiated during the eight preceding years was 108,410, or about forty-three per cent. of the existing members. It is further shewn in the Quarterly Reports that on the 1st January, 1846, the Order numbered 259,374 members. This number, it will be seen, gradually fell, until on the beginning of 1853 it reached 224,441, and from that time it has increased in the rapid manner shewn in the preceding Abstract, and bids fair to reach the maximum number attained in 1846.

This great fluctuation in the members, the unprecedented number of initiations, and the equal number of withdrawals, keeps the Unity, as already remarked, in the most unsettled, unstable, and unsatisfactory condition. Were its financial arrangements placed on a satisfactory basis more confidence would be inspired, the privilege of membership would be more valued, and no doubt seceders greatly reduced in number.

For a variety of important purposes the following figures, taken from the Quarterly Reports, throw valuable light, not only on the present condition of the Unity, but the economic and moral state of the working classes generally, and they should be carefully studied by every one watching the social progress of the day. In the Contribution on Criminal Statistics, pp. 303, 369, and 403, it will be found that the period of life of highest criminal intensity is ages 21–25, and hence arises the important practical bearing of all Benefit Societies on the moral condition of the people. Those are the very ages when admission to Friendly and Odd Fellow Lodges is most easy, and the following Abstract shews that during the years 21–25 as many as 42·983 per cent. of all the admissions took place between those ages. Viewing in connection with these results the well known fact that the least criminal portion of the whole community is represented by those who attach themselves to Benefit Clubs and Odd Fellow Lodges, it is evident that by means of these societies a very powerful and most beneficial influence may be exercised over that most important section of the population whose habits are as yet unformed, who have just entered upon the period of life of greatest criminal temptation, but who are still at the same time the most susceptible of acquiring those prudential feelings which find their best expression through the medium of their own Provident Institutions. Afford a young man the opportunity of joining well organised societies, and the respect he has for the opinion of his fellow members will exercise a powerful check on his criminal propensities.

The following gives the number of members who have joined the Manchester Unity of the Independent Order of Odd Fellows during each of the eight years 1848–55.

Age.	1848.	1849.	1850.	1851.	1852.	1853.	1854.	1855.	Total.
18	1066	953	1159	1070	1173	1965	2187	2343	11916
19	1235	1073	1229	1121	1186	2009	1969	2111	11933
20	941	786	829	803	832	1599	1913	2152	9855
21	1256	1152	1260	1266	1234	2236	2522	2670	13596
22	992	910	925	890	1062	1596	1911	1999	10285
23	962	810	774	895	900	1578	1839	2010	9768
24	773	732	694	701	693	1025	1171	1374	7163
25	604	596	568	628	610	895	814	1071	5786
26	629	635	698	661	696	840	1064	1218	6441
27	484	429	410	441	471	478	723	846	4282
28	394	412	378	385	381	500	557	688	3695
29	428	391	411	412	445	562	655	796	4100
30	290	278	277	302	234	339	355	479	2554
31	200	179	231	210	303	282	306	360	2071
32	159	169	177	156	188	245	267	315	1676
33	120	92	108	93	103	124	170	224	1034
34	29	74	89	72	72	125	135	214	810
35	58	41	46	53	61	109	156	231	755
36	25	20	31	24	31	53	58	128	370
37			14	10	13	21	25	27	110
38			8	9	5	9	10	14	55
39			4	8	9	7	10	35	73
40 and upwards			15	3	10	21	19	14	82
Total...	10645	9732	10335	10213	10712	16618	18836	21319	108410

The following is a condensed Abstract of the preceding results:—

Ages.	Admission in the Years 1848-55.	Ratio of Admission at each term of Life.	Ages.
18 to 20	33,704	31·089	18 to 20
21 ... 25	46,598	42·983	21 ... 25
26 ... 30	21,072	19·437	26 ... 30
31 ... 35	6,346	5·854	31 ... 35
36 and upwards	690	·637	36 and upwards
Total ...	108,410	100·000	Total.

From the preceding figures it will be seen that during the eight years, 1848–55, no less than 74·072 per cent. of all the admissions took place under twenty-six years of age, and the large proportion of 93·509 per cent. at ages not exceeding thirty.

Although it may appear, that notwithstanding the improvement in the Preston scale of contributions on the preceding ones in use, I have still presented a very unpromising picture of the present condition and prospects of the Unity; it would, while doing so, be

wrong to conceal the fact of other important changes having taken place since the publication of Mr. Ratcliffe's valuable Report in 1850. In the earlier editions of "Observations on Odd Fellows and Friendly Societies," it was distinctly affirmed (*See* second paragraph page 527 *seq.*) that much good would flow from the publication of the results of any such investigations as that subsequently and so ably conducted by him. It is, therefore, most satisfactory to find this view of the matter practically verified.

Since that time, as already stated, the large majority of lodges has improved their rates of contributions, either by increasing the periodical payments, or in lessening the benefits by reducing the amount of funeral gift, and limiting the time to which members are to be entitled to full sick allowance. This latter step, on many grounds objectionable, has only the merit of bringing the contributions and benefits nearer to each other in value. Mr. Ratcliffe, in the Appendix to the Quarterly Report for January 1853, has actually calculated specimen Tables for the lodges in which it is assumed that the benefits in sickness will finally be reduced to three shillings per week, and, in old age, to two shillings and sixpence weekly. It can however never be meant to reduce Odd Fellow Lodges to so degraded a position; the title of the Order must be altered first. It could never be called an "Independent Order" by thus making it a mere receptacle of infirm paupers for the workhouse. In no instance should the allowance granted to members be permitted to fall below such sum as would be self-supporting. If the rates of contributions be inadequate for that purpose, the proper remedy is to increase them. I am also given, on the best authority, to understand that there is now not a single branch of the Unity which does not keep its management expenses separate and distinct from the funeral and sick-gift funds. This is, indeed, an unmistakeable advance in the right direction. The Unity is also now a registered society. From the Quarterly Report for April 1856, it appears that, at the beginning of that year, "two "hundred and ninety-five districts, containing 190,414 members, have registered their "laws, and one hundred and thirty-eight districts (including foreign and colonial), "containing 60,526 members, still remain unregistered as districts, but many lodges in "those districts have availed themselves of the privileges conferred by the Friendly "Societies' Act, and have registered their rules." All these societies must, therefore, make quinquennial returns to the Registrar of Friendly Societies, and the preparation of these is certain to lead to inquiry on the part of members, inquiry to discussion, discussion to clearer views and more carefully formed opinions, and thence giving birth to wiser laws and regulations. Some lodges are also adopting the plan of having periodical valuations of their assets and liabilities—a thing some years ago altogether unheard of amongst them. This, if general, would lead to the best results; but, if deferred until too late a period, lodges may find it impossible to recover themselves from the effects of past deficiencies.

Recently there has been revived, in one or two influential quarters, proposals to establish what are generally termed Yearly Societies. These will be found alluded to in Question No. 477 of Lord Beaumont's Report, and are undoubtedly the most objectionable of all sorts of Benefit Societies, as the members are simply required to meet the current risks of the year; they do not recognise the principle which is the foundation of all true Friendly Societies,—that of making a provision in youth for the winter of life. This is a principle which the physical laws of nature and the necessities of civilisation impose on the promoters of every Friendly Society, and it may be easily shewn that if an attempt be made to evade it, the formation of a permanent Friendly Society is impossible. Let it be assumed that a club is formed on the bases of the contributions providing for the necessities of the year only, and that, in the first instance, the members consist chiefly of young men, ranging from twenty to thirty years of age; on referring to Table E. pp. 26–7, and Table V. page 409, it will be found that, for the average of the first period of ten years a contribution of about nine shillings, from year to year, would suffice to grant sickness allowances of ten shillings a week to those who are invalided. During the next ten years, when the ages of the original members of the society range from thirty to forty, the contribution for the same benefit will need to be only slightly raised, namely to ten shillings from year to year. Such societies usually balance their affairs at the end of each year, and then begin *de novo*; but whether this be done or not, and a fresh election of members takes place, is immaterial for the purpose of the following illustration. On referring to column (8) of the Abstract on page xxiv preceding, it will be found that from five to fourteen per cent. of all the sickness experienced by members at the periods of life now under review is sickness protracted beyond the period of one year's duration. Again, assuming the society to go on for another period of ten years, when the original members shall range from forty to fifty years of age, the contributions from year to year, to provide the same benefits will require to be increased to about sixteen shillings, but in this decennium the sickness which shall be experienced after twelve months duration will amount to from about nineteen to upwards of twenty-five per cent. of the whole sickness to which the society is liable, and the sickness which shall actually be experienced after two years invaliding is no less than from ten to fifteen per cent. of the whole. Hence the question arises, would the healthy members of a society thus constituted consent to so severe and almost permanent a burden? Would they not, when balancing their books from year to year naturally complain and object to the renewal of the membership of those who are receiving so much of the proceeds of their contributions? For example, according to Table NN, page 446, *seq.* five per cent. of the members during the decennium now under consideration would, in lieu of their small contributions, have received a minimum £.26 each, and some of them three or four times that amount, but in the next decennium fourteen per cent. of all the members would be in this condition, and the ratio,

as shewn in Table NN, going on rapidly increasing. Yearly Societies have not, however, existed long enough to go through this ordeal. In the ten years we are now considering, when the ages of the original members range from fifty to sixty, a further, and perhaps a more serious practical difficulty is obvious. To provide for the current liabilities, the contributions would need to be nearly doubled, or £.1 10*s.* yearly, and those members who pass on to the next decennium would have to pay the impossible sum, for the time of life, of four guineas a year, exclusive of the payments necessary to make provision for funeral allowance to the member or his wife, pensions or annuities in old age, and the expenses of management of the society.

It is scarcely necessary to argue that from the physical impossibility of escaping numerous cases of protracted sickness at all periods of life, and the very high ratio of general sickness at the more advanced ages, rendering it impossible for working men at that time to provide for the current liabilities out of their earnings, the management of a "Yearly Friendly Society" is impracticable, unless at the younger ages; hence exists the usual rule of excluding from such societies all persons from membership beyond a given age, say forty or fifty-five. To encourage the formation of such societies would be to inflict a severe blow on all those who might be tempted to join them. They are destructive of the real purpose for which Benefit Societies were originally intended; inasmuch as the old and infirm, for whom Provident Institutions are most destined to do good, cannot avail themselves of them, and they certainly stand in the way of persons entering better constituted societies, for they draft off members in the vigour of life, and only retain them until such time as when, from advanced age, the necessarily high scale of contributions practically excludes them from admission to the best class of Friendly Societies.

The experience of all the best constituted societies demonstrates the impracticability of the working classes joining them in any considerable numbers, except at the younger periods of life—under the age of thirty. From that age to forty, owing to the rapidly-increasing rates of contributions, the numbers are very small, and beyond the age of forty, the numbers become exceedingly limited. Even in the Odd Fellow Lodges, possessing many social inducements to membership, this is borne out in a remarkable manner by the facts set forth in the Abstract in page xxxiii preceding. The liability to sickness and death is at a comparatively low ratio at the younger ages, and unless members, by entering a society at early life, pay rates of contributions more than equivalent to meet the evils of the hour, a time will arrive when the sickness with which they are overtaken is beyond their resources. It is, therefore, necessary to store up in youth for the vicissitudes of old age, and on this principle every Friendly Society, worthy of the name, has been founded.

Much has been said of late on the necessarily inherent instability of Friendly Societies, and, on their presumed want of permanence, various suggestions have been

made, by which it is proposed to transfer to the management and responsibility of the Government some of the most important branches of their transactions and benefits. A deal of information is given in pp. 408-530 on the various circumstances which influence the permanence of Friendly Societies. A patient perusal of those pages will distinctly shew that there is no institution of the day connected with the social progress of society which can be regarded, in a financial sense, so safe and permanent in its character as a Friendly Society, conducted on the principles therein pointed out, and now fully recognised by every one experienced in the management of this class of Provident Associations, conclusively proving that they offer the most undoubted security which can be conceived for the fulfilment of their engagements, their duration, and their permanence. It is believed impossible to point out a single instance in any part of the country whatever of the failure of a Friendly Society in which one or all of those conditions of stability and safety have not been violated.

These conditions may be briefly recited.

In the first place it is necessary, as fully shewn in pp. 514–21, *seq.* that every society should consist of members sufficiently numerous to realise the average results anticipated in the calculations on which its tables of contributions and benefits are founded. If this principle be not attended to, and the societies are small, the best and most skilful calculations may be insufficient to maintain their solvency. It might happen that rates very much in excess of what might be necessary in a large institution would, owing to adverse fluctuations, be totally inadequate to provide the benefits promised to the members; or, on the other hand, rates that would be ruinously low in a society of considerable magnitude, might, from the prevalence of favourable ratios of sickness and mortality, prove quite ample, and even leave a surplus in a society of a limited number of members. This case is exceedingly well put in the Report of the Preston District Sick Union (*see* pp. 515–19, *seq.*), and the various Quarterly Reports of the G. M. and Board of Directors also contain frequent allusions to societies breaking down or closing owing to adverse results from small numbers, while others, in which little sickness has been experienced, from the avarice and cupidity of the members, inducing them to pocket the Surplus Funds. In the Report for April, 1855, it is stated that—"Those who have paid "attention to the average rate of sickness, when the experience of few members has been "obtained, must have been struck with the very large ratio in some instances experienced, "in other instances with the small rate of average sickness, and, when it is considered the "number of lodges in the Unity having few members, it is surprising that more lodges are "not compelled to close, by experiencing far more than the average rate of sickness. "During the year 1854, twenty lodges have joined other lodges; thus, instead of existing "as forty separate and distinct lodges, they only form twenty lodges in number, and "causing the number of lodges in the Unity to be diminished by twenty." "Many of

" the lodges that have been closed, during the year 1854, have had considerably less than " the average amount of sickness amongst their members, and this for a considerable " period of time, and which has enabled many of them to realise funds of £.10 per " member, others more, and one as high as £.25 per member; in some few other " instances they have experienced more than the average sickness, and their funds have " been reduced; one lodge only closing for want of funds to pay their sick members. " When it is seen that twenty lodges, containing 539 members, have closed during the " year, it will be very apparent, that with the average number of members forming these " lodges, that when one or two members fall sick, in so few a number, their funds must " soon become exhausted." In fact, unless the number of members in a society be considerable, there can be no security for its stability, however great the skill and judgment exercised in its management in other respects. Inattention, therefore, to this one element is of itself sufficient to produce failure in Friendly Societies.

In the second place, as pointed out in pp. 439 and 527, a periodical investigation should be instituted into the state of the society's affairs. Such periodical inquiries would afford the means of correcting any misconceptions which may have existed either at their formation or at any subsequent stage of their progress, in respect to the rate of sickness and mortality to which they are presumed to be liable; and the actual experience of each society would thus be brought to bear upon the financial adjustment of its assets and liabilities. These investigations should be made at not greater intervals than five years. One great mistake often made by the promoters and managers of small societies, is that they conceive if a particular society is eminently successful under a given scale of contributions and benefits, that those who are residing in another district, and living under different influences, cannot do better than follow the example of their neighbours in the adjustment of the contributions and benefits. This impression is natural enough; but no conclusion has of late years been better established by practical research than the fact of the great disparity which exists between the ratios of sickness among societies established even in adjacent districts. This has been fully shewn in pp. 408–68, even when the number of members in the societies is sufficiently large to realise the average amount of sickness peculiar to the district. Hence, the necessity and the advantage of regulations imposing on societies the duty of periodical investigations into their affairs; for by this means, actual experience, the most valuable of all teachers, is made operative in their future conduct and management. It is well known that in the county of Wilts, (see page 437) large and well-conducted societies have been subject to an unusually low ratio of sickness; that in Somersetshire, other societies, equally well-conducted, have been subject to an unusually high ratio of sickness; while in the intermediate districts of Devonshire, the ratio of sickness actually experienced by a large and well-managed society has proved very different from those which prevail in the other

two counties. It will also be found, that comparing the sickness experienced in two agricultural counties, Essex and Hampshire,—that in Essex, the sickness is unusually high; while in Hampshire it is considerably under the average. The causes of these variations are fully discussed in the following contributions. Similar differences will be found to prevail in the experience of societies in different manufacturing towns, examples of which are given in pp. 429–38. Hence, the imperative necessity of periodical investigations, such as those herein suggested, in order to maintain the solvency and permanency of Provident Societies. As already stated, many lodges in the Manchester Unity have recently become alive to the advantages arising from periodical examinations of their assets and liabilities, and so great was the importance attached to these investigations that it was actually rendered compulsory on societies enrolled under the 9 and 10 Vict., c. 27, although unwisely omitted in all the subsequent Acts.

In the third place, there should be a regulation by which every society shall have a separate and distinct account kept of the receipts and disbursements made in respect of each benefit or fund. From the passing of the 8 and 9 Vict., c. 27, this was compulsory on all societies subsequently enrolled, until repealed by the 18 and 19 Vict., c. 63. The advantage of such a regulation is, that if the financial condition of any particular fund or benefit is at fault, the error would be more easily discovered than if the whole receipts and disbursements of the society were kept collectively. It might happen for instance, that while all the other funds of a society were well regulated, so far as their contributions and benefits were concerned, that the sickness benefits were making ruinous inroads on the society's assets; but from the accounts being kept in the aggregate, this evil may not be perceived until it is too late to apply a remedy. If, however, the suggestion here offered had been adopted, it is evident that all such untoward influences would have manifested themselves at a much earlier period, and when corrections could have been in time applied to restore the fund to a healthy and normal condition. Such societies have unfortunately been too often assumed to be in a prosperous condition, from the mere fact of their accumulated capital having kept increasing year after year. But as no portion of the money received for superannuation allowances and other deferred benefits should be touched for a long period of years, this fact was lost sight of in the aggregate system of accounts, and the monies belonging to them too often infringed upon for payments on account of the sickness fund, owing to the inadequacy of its contributions.

It can be abundantly proved, by the citation of numerous well known instances, that many societies would have been saved from ruin and dissolution, by the early adoption of such a rule as the one now suggested; while in many other instances in which the breaking up of societies did not ensue, the hardship of one class of members supporting another, between which there was no common interest, would have been avoided.

The fourth precaution necessary to be observed is never to allow any member to subscribe for a sickness allowance greatly exceeding the average of the benefits allowed to all the members collectively; and never, in any instance, to permit a member to subscribe for a sickness allowance which shall exceed two-thirds or three-fourths of his usual or average earnings while following his ordinary avocations. The enforcement of this condition would form a great protection in the administration of the society's affairs, and maintain a healthy moral tone of action amongst the members. Such a rule simplifies the administration of the sickness benefits, and is conservative of the society by placing the members in a better position in regard to its management. The society's prosperity is greatly promoted by the practice of never admitting any members to subscribe for a greater sickness allowance than will always, irrespective of other conditions, maintain a healthy inducement in the minds of sickness claimants to return to their occupations as soon as they possibly can with safety, rather than linger on the funds. Nothing can be more injurious and detrimental, both to the members and the society, than to permit of sickness allowances being granted that shall closely approximate to the member's earnings. There is scarcely any consideration by which it is possible to justify such a proceeding. The best securities for a society's success would be afforded in the adoption of this regulation.

A careful consideration of the four conditions now urged will shew that their practical effect is to maintain a constant adjustment between the contributions made by the members under all varying circumstances, and the liabilities they entail on the society. Were these four leading principles strictly oberved in the management of Friendly Societies, failure is next to impossible. Let them be practically adopted and it is difficult to conceive any human institution more beneficial and permanent.

It is not therefore to be assumed, as has of late been said in various influential quarters, that Friendly Societies are in their nature essentially instable. An attentive consideration of their history will satisfactorily shew the wonder is, that with so little information, until quite recently, of the real nature and extent of their liabilities, more of them have not broken down. It has been too much assumed, by even the educated classes and not a few of those distinguished persons who have identified themselves publicly with the interests of these societies, that at best they were but mere pot-house schemes and temporary expedients as adjuncts to a small parish or congregation, simply calculated to assuage the evils of a day. It has remained for the working classes themselves to demonstrate that their Benefit Societies are capable of accomplishing much beyond this, and those must be indifferent spectators indeed of the social progress amongst the industrious community who cannot clearly discern that through one form or other of these institutions, whether in the shape of the ordinary Friendly and Benefit Society, the Odd Fellow, Foresters, and Druid Lodges, the Rechabite Tents, and other

description of Benefit Clubs, the hard working prudential people of this country have already begun to work out in good earnest their own regeneration and independence. These associations are therefore certain, before long, to become engrafted with all the essential elements of stability and permanence which have just been pointed out.

No doubt Benefit Societies have suffered from many serious evils, but these will be found to have nearly all arisen from ignorance and inexperience. More light, however, has now dawned upon them. Even our Assurance Institutions, which are more simple in principle and much less difficult in management, have been any thing but free from grave objections, but no one attempts in consequence to transfer their business and their responsibilities to the Government of the country. Let us see therefore the merits of the proposal made, on the plea of the insecurity of Friendly Societies, that the working people of this country should purchase deferred annuities and pensions from the Government, under the 16th and 17th Vict., cap. 45.

Apart from the objection so often urged, that the people have always shewn a great aversion to have any dealings in connection with their Benefit Clubs with the Government, and hence the immense multitude, hitherto, of unenrolled societies, and the striking failure of the corresponding attempt to sell Government Annuities to them under the 3rd William IV., cap. 14. It is of the first importance that the fact of this failure on the part of the Government should be thoroughly understood, especially by those now endeavouring to ingratiate into the favour of the people the recent Annuity Act. Great efforts were originally made by the Government officials to render the scheme successful. It was arranged that through the medium of savings banks such annuities could be purchased, and that in any parish or place in the United Kingdom where no savings bank was legally established, it was lawful to establish a society for carrying the provisions of the Act into execution, and that annuities of not less than £.4 nor more than £.30 per annum, might be secured, and the annuities might be either "immediate," "deferred," or "temporary annuities for a certain number of years." In this latter respect the former Act was more comprehensive than the recent one. Provision was also made that the consideration money for the annuities may be paid either in one sum in the first instance, or by weekly, monthly, quarterly, or yearly instalments, as may suit the convenience of the purchaser. In this respect also the former Act had an advantage over the present one, for it was provided, that if the contract were for a deferred annuity, to be purchased by annual payments, such annual payments must be made to the Commissioners yearly, although for the convenience of the purchaser the money might be received from him by the manager in weekly, monthly, or other instalments. The recent Act repeals the former one and contains no such provision. To the working man the existing Act is further inconvenient, as the fractional parts of one pound of annuity will not be granted, whereas this rule was in the former one limited to the fractional part of

sixpence. It will likewise be found that the annuities were granted on more liberal terms under the 3rd William IV., cap. 14, than under the recent Act, 16th and 17th Vict., cap. 45.

The following shews the terms required to secure an annuity of £.20 per annum, or not quite eight shillings weekly, according to each Act.

Age at Purchase.	Purchase Money of Annuity deferred 25 Years.						Age at Purchase.
	By Single Payment.			By Yearly Payment.			
	3rd Wm. IV. c. 14.	16th and 17th Vict. c. 45.		3rd Wm. IV. c. 14.	16th and 17th Vict. c. 45.		
	Both Sexes.	Males.	Females.	Both Sexes.	Males.	Females.	
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.	
20 to 21	114 11 6	137 0 0	152 13 4	6 14 6	7 13 4	8 11 8	20 to 21
30 ... 31	91 13 0	108 6 8	126 3 4	5 7 6	6 1 8	7 1 8	30 ... 31
40 ... 41	68 8 0	80 0 0	93 8 4	4 0 0	4 10 0	5 5 0	40 ... 41
50 ... 51	45 10 0	52 11 8	60 18 4	2 13 6	3 0 0	3 8 4	50 ... 51

It will be thus seen, that under the former Act the annuities were granted on much more favourable terms. In the above examples, the recent Act exacts an increase on the purchase money, by single payment of 18·053 per cent. in the case of males, and of no less than 35·312 per cent. for females; while the increase by annual payments amounts in the case of males to 13·182 per cent., and in that of females to 29·603 per cent.

Taking all these matters into account, it is evident that the present Act offers very inferior inducements to annuitants than that which has been repealed; but notwithstanding, the former Act, after having been in force for twenty years, entirely failed in the accomplishment of the object intended by its enactment. It is stated that in the whole of that period, only 2043 members have availed themselves of its provisions. The fact is, the members of Benefit Clubs have a strong, and it may be said in this instance, a well and justly conceived dislike to Government interference in such matters. Were there no other reason than the delay and annoyance to which working men, or the societies representing them, would be put by the circumlocutory formula through which all such transactions must necessarily pass, whenever undertaken by the Government of the country, there would be sufficient reason to render the operations of the Act unpopular and therefore unsuccessful. But there are still more formidable reasons to be advanced against it. Deferred annuities constitute one of the class of benefits for which provision can be more successfully made by Friendly Societies than any other. In the first place,

an examination into the state and condition of health is unnecessary, for if the annuitant's health be bad, that is in favour of the society. In the second place, the administration of the benefit is one of the most simple: it does not require the constant watching and medical scrutiny and skill necessary in the administration of the sickness benefits. And in the third place, the financial operations connected with it are also of the simplest kind possible. In the management of the sickness and death allowance benefits, a portion of the funds must be always kept on hand, or at immediate call, to meet the constantly occurring claims, and the consequence is, that unless a calculation be entered into, on the plan recommended in pp. xxxviii and xxxix, *ante*, to be made quinquennially, it is impossible to tell with any precision whether undue inroads are being made on the funds of those benefits or not. In regard however to deferred annuities, the case is very different, for every farthing in the shape of contributions must be husbanded and improved at interest, and remain untouched until the time arrives which is fixed for the annuitant to receive his pension; and even then, unlike the case of the sickness benefit, nothing more is needed to be established than the fact of his identity. All the trouble of visitation and medical scrutiny, to determine whether the sicknesss is feigned or otherwise, is unnecessary. The system of accounts and the whole management are therefore as simple as possible. It is, in consequence, difficult to conceive how any disaster could befall this branch of a society's affairs, always supposing the management subject to such of the four conditions, already mentioned, as may affect it. This statement is not a mere speculative opinion, for while the failure of so many sickness clubs has to be lamented, a great number of annuity societies, established even when such matters were but imperfectly understood, can be pointed to as having been eminently successful; with periodical examinations of their affairs, it is next to impossible to conceive how, especially at the present time, when the laws of mortality are so much better understood, that it could be otherwise.

But in pp. 524–6 other important reasons are given why Sickness Societies should grant Deferred Annuities. The proper introduction of annuity schemes into Friendly Societies, and particularly into large societies, such as the Christian Mutual Provident, the Western Provident, and all other large and county societies, which extend over considerable districts, as well as a gigantic institution like the Manchester Unity, would possess advantages of a high and important character in equalising the risks of different districts and occupations, and enabling the societies to adopt something like uniform scales of contributions and benefits by which the liabilities from sickness and annuities shall have a constant corrective influence on each other.

Independent, however, of the attempt to engraft the recent Annuity Act on Benefit Societies, and thereby disturb the peaceful and improving condition which, for several years, in spite of many disturbing influences, they have been gradually assuming, it

cannot be denied that, in respect to them there has been a great deal of over-legislation. A curious and somewhat amusing proof of this will be obtained by a perusal of pp. 8–36 of the Appendix to the First Report of the Registrar of Friendly Societies in England. It will be found that between 1793 and 1855 no less than twenty-three Acts have been passed affecting them; and in the ten years, 1846–55, as many as ten Acts, or one per annum. To know how instable the legislative opinion is on such matters, the Analysis of the 9 and 10 Vict. c. 27, 13 and 14 Vict. c. 115, and 18 and 19 Vict. c. 63, will well repay a perusal. The constant change of object, scope, and privilege, under these three Acts has done much to retard the development of the larger and better conducted class of Friendly Societies, established within the last few years.

It is hoped the present publication, by giving new assurance to the whole class of provident institutions, will, in some measure, counteract this influence, and give a fresh impetus to their progress. The evident tendency in the minds of public men at the present time is to a conviction that the working people can, by legislative processes, be constrained impulsively to the adoption of prudential and saving habits. No mistake, however, is more fatal to the success of the institutions themselves. All that is needed to be done is, to enable the members of them, as between themselves, and also as between them and third parties, to sue and be sued, in a cheap and expeditious manner, and leave all the rest to themselves. Their experience, judgment, interest, and tact, will soon discover the most beneficial modes of management, without Government patronage or supervision. The members of Friendly Societies in this country form a much more important class socially, intellectually, and politically, than is generally supposed. To strengthen those habits of prudence and forethought, which they already manifest to a considerable extent is a work of time, a gradual process, almost entirely dependent on themselves. Calm deliberation can alone help them, and it is trusted that the large amount of information now submitted for their help and guidance in the management of their societies will aid to bring about that happy consummation of their interests which even those of wealth and exalted station may behold with pleasure, saying—

"*Quam bonum et jucundum est habitare fratres in unum.*"

The People's Provident Society,
2, Waterloo Place, London,
24th February, 1857.

DURATION OF LIFE IN ENGLAND AND WALES.

The best record of the General Mortality in England and Wales is contained in the Annual Reports of the Registrar General. So far as relates to the number of deaths in the entire community, more complete returns could not be hoped for.

The 5th Report of the Registrar General contains a table of the Expectation of Life, calculated on the mortality of the year 1841. The census of the population having been taken in that year, offered a ready means to determine the value of life for that period; but as the results of the mortality for several years would undoubtedly form a broader and more satisfactory basis on which to found a measure of the duration of life in this country, it is proposed to calculate a table on the 2nd, 3rd, 4th, and 5th Reports of the Registrar General; omitting the 1st Report, that any imperfections incidental to the early management of the Registers may be avoided. It is evidently necessary to ascertain the exact amount of population living at various ages in the country, during the periods of time to which the returns of deaths relate, before results can be obtained, shewing the ratio of the population dying at the respective ages.

Previous to the population being calculated for the mean time of each period embraced in the 2nd, 3rd, 4th, and 5th Reports, it will be necessary to apply a correction to the enumeration of the population at the period of the Census.

In 1841, the ages of 35,408 males and 11,472 females, or ·456 per cent. of the one, and ·141 per cent. of the other, were not given. In the registration of deaths, the ages of a certain proportion are also omitted; and if the ratio were the same in both cases, those whose ages were not specified might be left out, as the omission of the one would be corrected by the omission of the other; but it happens that, in the returns of deaths over the entire four years referred to, the number of males whose ages were not specified

was only 1,650, or ·235 per cent. of the whole; and of females 896, or only ·132 per cent. of the whole female deaths. Independent corrections will, therefore, have to be applied to each class of results.

Let a = population whose ages were ascertained,
b = total population, and
x = the number enumerated at any particular period of life; and let
$\lambda b - \lambda a = \lambda y$, then
$\lambda y + \lambda x$ = log. of the actual number alive at the period of life x, provided the age of every person had been ascertained.

This correction having been made for the unenumerated ages in the respective censuses of 1821 and 1841, the results obtained form the 2nd, 3rd, 5th, and 6th columns of Table A.

Table A.

Corrected Enumeration of the Population of England and Wales for 1821 and 1841; with the Annual Rate of Increase during the Intermediate Period.

Ages.	MALES.			FEMALES.			Ages.
	Population 1821.	Population 1841.	Annual Rate of Increase.	Population 1821.	Population 1841.	Annual Rate of Increase.	
Under 5	898324	1047502	1·007711	884866	1057926	1·00897	Under 5
5 ... 10	787426	952437	1·00955	779516	951687	1·01002	5 ... 10
10 ... 15	685011	879732	1·01258	650342	851649	1·01357	10 ... 15
15 ... 20	578504	780967	1·01513	611741	805090	1·01382	15 ... 20
20 ... 30	857697	1333088	1·02229	1029526	1498751	1·01895	20 ... 30
30 ... 40	673718	999000	1·01989	741881	1051505	1·01759	30 ... 40
40 ... 50	547372	748487	1·01577	572227	777500	1·01544	40 ... 50
50 ... 60	388351	496475	1·01235	402245	529274	1·01381	50 ... 60
60 ... 70	262728	329563	1·01039	284624	369498	1·01313	60 ... 70
70 ... 80	130544	159551	1·01008	142366	184468	1·01303	70 ... 80
80 ... 90	33577	41224	1·01031	41480	53164	1·01248	80 ... 90
90 ...100	2556	2986	1·00776	3747	4967	1·01420	90 ...100
100 and upwards.	68	82	1·00956	148	167	1·00628	100 and upwards.
Total	5845676	7771094	1·01415	6144709	8135647	1·01530	Total.

The 2nd, 3rd, and 4th Reports of the Registrar General gave the number of deaths in the year preceding the 30th June, 1839, 1840, and 1841 respectively; and the 5th Report gave the deaths for the year ending 31st December, 1841. The next step required was to determine the population alive at various ages for the mean time of each of the given periods, that is, the population at the various terms of life in England and Wales on the 31st of December, 1838, 1839, 1840, and 30th June, 1841; and the following method was employed:

$\lambda\pi+\left(\frac{\lambda\pi-\lambda\beta}{20}\right)\theta$ = log. of the population at the given term of life for the mean time of the period required, in which

β = the corrected population at the given age on the day of the Census in 1821,

π = the same for 1841, and

θ = the period elapsed in years and days between the given period and the day of the Census in 1841.

The population for each of the periods being obtained in this manner for every term of life, the combined results form columns 2nd and 5th of TABLE B.

It might have been deemed sufficient to have made the expression $\frac{\text{Log. } \pi - \text{log. } \beta}{20}$ represent the rate of increase on the general population for all ages; but a glance at columns 4 and 7 of TABLE A will shew the necessity of obtaining an independent value to this expression for each term of life; for, by adopting $\frac{\text{Log. } \pi - \text{log. } \beta}{20}$ as the rate of increase for every term of life, it would have produced a difference in the male population at ages 20 to 30 of 42108 in TABLE B, or, in other words, an apparent decrease of mortality at that term of life; and consequently, at some other terms, opposite errors in the results would be produced.

Corrections, precisely similar to those applied to the enumeration of the population, were made on the registration of deaths; and the final results for the four years referred to are given in columns 3rd and 6th of TABLE B.

It may be observed here, that as the deaths happening in the last half of the year forming the fourth period of the Registrar General, and those taking place in the first half of the year forming its fifth period, are identical, they will of course be included twice in the results now referred to; but as the population has also been taken for the mean of both periods or years, the proper relation is maintained between the population and deaths.

The preceding step was rendered necessary, from the Registrar General having changed the period for his Annual Report from the 30th June to the 31st December, without having, at the time of making the change, distinguished the deaths belonging to each half year.

All the preceding corrections having been applied to the population and deaths, the combined results form TABLE B, the 4th and 7th columns of which shew the mortality per cent. at the various terms of life for each sex in England and Wales during the four years referred to, and under that form constitute a complete measure of the value of life, during the same period, in the general population of this country.

Table B.

England and Wales.—Total of the Population as calculated for the 31st December in the years 1838, 1839, 1840, and 30th June, 1841; with the Sum of the Corrected Deaths for the corresponding years as given in the 2nd, 3rd, 4th, and 5th Reports of the Registrar General; and the Mortality per cent. during that period.

Ages.	MALES.			FEMALES.			Ages.
	Population.	Deaths.	Mortality per Cent.	Population.	Deaths.	Mortality per Cent.	
Under 5	4156265	292968	7·048	4192129	254170	6·063	Under 5
5 ... 10	3771901	36588	·970	3767019	35494	·942	5 ... 10
10 ... 15	3473008	18199	·524	3358717	19175	·570	10 ... 15
15 ... 20	3075023	22464	·730	3174272	26003	·819	15 ... 20
20 ... 30	5210180	50765	·974	5878257	56298	·957	20 ... 30
30 ... 40	3914433	43451	1·110	4129820	47174	1·142	30 ... 40
40 ... 50	2945219	42770	1·452	3060397	40781	1.332	40 ... 50
50 ... 60	1960445	44196	2·254	2086819	40593	1·944	50 ... 60
60 ... 70	1302647	55491	4·259	1457878	54414	3·372	60 ... 70
70 ... 80	631509	57449	9·097	727904	60229	8·274	70 ... 80
80 ... 90	163089	32461	19·904	209902	38064	18·134	80 ... 90
90 ...100	11846	4282	36·316	19568	6650	33·984	90 ...100
100 and upwards.	325	137	42·154	662	311	47·277	100 and upwards.
Total	30615890	701221	2·290	32063344	679356	2·119	Total.

The results now described in columns 4th and 7th of Table B, were made to represent the rate of mortality at the mean age of that period of life opposite to which they are placed; intermediate terms were then found by the method of third differences, as fully explained in a subsequent portion of this contribution, and the whole was subsequently corrected as follows:

Let δ_1 represent the first term;

δ_2 ... second;

δ_3 ... third;

δ_n ... the n^{th} term; then

$$\frac{\delta_1 + \delta_2 + \delta_3 + \delta_4 + \delta_5}{5} = \delta_3$$

$$\frac{\delta_2 + \delta_3 + \delta_4 + \delta_5 + \delta_6}{5} = \delta_4 \quad \text{And}$$

$$\frac{\delta_{n-4} + \delta_{n-3} + \delta_{n-2} + \delta_{n-1} + \delta_n}{5} = \delta_{n-2}$$

The adjusted results thus obtained form columns 4 and 9 of Table C, and may be considered a fair expression of the rate of mortality at the respective ages opposite to which they are placed in the Table. Columns 2nd and 3rd, 7th and 8th in the same Table, shew, out of 100,000 persons attaining the age of ten years, the number living to each subsequent year of life, and also the numbers dying in each successive year of life. Columns

[5 and 10

Table C.

England and Wales.

Age.	MALES.				Age.	FEMALES.				Age.
	Living.	Dying.	Mortality per Cent.	Specific Intensity.		Living.	Dying.	Mortality per Cent.	Specific Intensity.	
10	100000	791	·791	126·422	10	100000	792	·792	126·263	10
11	99209	696	·702	142·450	11	99208	712	·718	139·276	11
12	98513	624	·633	157·978	12	98496	653	·663	150·830	12
13	97889	576	·588	170·068	13	97843	618	·632	158·228	13
14	97313	555	·570	175·439	14	97225	610	·627	159·490	14
15	96758	562	·581	172·117	15	96615	627	·649	154·083	15
16	96196	598	·622	160·772	16	95988	671	·699	143·062	16
17	95598	636	·665	150·376	17	95317	710	·745	134·228	17
18	94962	673	·709	141·044	18	94607	744	·786	127·227	18
19	94289	706	·749	133·511	19	93863	769	·819	122·100	19
20	93583	734	·784	127·551	20	93094	786	·844	118·483	20
21	92849	757	·815	122·699	21	92308	794	·860	116·279	21
22	92092	778	·845	118 343	22	91514	804	·879	113·766	22
23	91314	800	·876	114·155	23	90710	815	·898	111·359	23
24	90514	822	·908	110·132	24	89895	825	·918	108·933	24
25	89692	840	·937	106·724	25	89070	835	·937	106·724	25
26	88852	853	·960	104·167	26	88235	845	·958	104·384	26
27	87999	863	·981	101·937	27	87390	854	·977	102·354	27
28	87136	870	·998	100·200	28	86536	863	·997	100·301	28
29	86266	872	1.011	98·912	29	85673	870	1·016	98·425	29
30	85394	874	1·023	97·752	30	84803	878	1·035	96·618	30
31	84520	876	1·036	96·525	31	83925	884	1·053	94·967	31
32	83644	877	1·049	95·329	32	83041	891	1·073	93·197	32
33	82767	880	1·063	94·073	33	82150	895	1·089	91·827	33
34	81887	883	1·078	92·764	34	81255	900	1·108	90·253	34
35	81004	887	1·095	91·324	35	80355	902	1·123	89·047	35
36	80117	892	1·113	89·847	36	79453	904	1·138	87·873	36
37	79225	898	1·134	88·183	37	78549	906	1·153	86·730	37
38	78327	906	1·157	86·430	38	77643	906	1·167	85·690	38
39	77421	917	1·184	84·459	39	76737	906	1·181	84·674	39
40	76504	927	1·212	82·508	40	75831	906	1·195	83·682	40
41	75577	941	1·245	80·321	41	74925	908	1·212	82·508	41
42	74636	955	1·279	78·186	42	74017	911	1·231	81·235	42
43	73681	972	1·319	75·815	43	73106	916	1·253	79·808	43
44	72709	990	1·362	73·421	44	72190	923	1·279	78·186	44
45	71719	1009	1·407	71·073	45	71267	931	1·306	76·570	45
46	70710	1028	1·454	68·776	46	70336	940	1·336	74·850	46
47	69682	1049	1·506	66·401	47	69396	953	1·373	72·833	47
48	68633	1071	1·560	64·103	48	68443	966	1·411	70·872	48
49	67562	1095	1·621	61·690	49	67477	982	1·455	68·729	49
50	66467	1120	1·685	59·347	50	66495	999	1·502	66·578	50
51	65347	1151	1·760	56·818	51	65496	1020	1·557	64 226	51
52	64196	1183	1·843	54·259	52	64476	1043	1·618	61·805	52
53	63013	1219	1·935	51·680	53	63433	1072	1·690	59·172	53
54	61794	1258	2·036	49·116	54	62361	1102	1·767	56·593	54
55	60536	1299	2·146	46 598	55	61259	1143	1·866	53·591	55
56	59237	1339	2·260	44·248	56	60116	1192	1·983	50·429	56
57	57898	1386	2·394	41·771	57	58924	1237	2·099	47·642	57
58	56512	1429	2 529	39·541	58	57687	1277	2·214	45·167	58

Table C.—(*continued.*)

England and Wales.

Age.	MALES.				Age.	FEMALES.				Age.
	Living.	Dying.	Mortality per Cent.	Specific Intensity.		Living.	Dying.	Mortality per Cent.	Specific Intensity.	
59	55083	1478	2·683	37·272	59	56410	1325	2·349	42·571	59
60	53605	1527	2·849	35·100	60	55085	1365	2·478	40·355	60
61	52078	1583	3·040	32·895	61	53720	1410	2 625	38·095	61
62	50495	1637	3·242	30·845	62	52310	1463	2·797	35·753	62
63	48858	1697	3·474	28·785	63	50847	1529	3·007	33·256	63
64	47161	1754	3·719	26·889	64	49318	1594	3·232	30·941	64
65	45407	1815	3·997	25·019	65	47724	1666	3·491	28·645	65
66	43592	1868	4·285	23·337	66	46058	1732	3·760	26·596	66
67	41724	1923	4·609	21·697	67	44326	1801	4·063	24·612	67
68	39801	1969	4·947	20·214	68	42525	1863	4 381	22·826	68
69	37832	2016	5·328	18·769	69	40662	1929	4·744	21·079	69
70	35816	2054	5·735	17·437	70	38733	1985	5·125	19 512	70
71	33762	2092	6·197	16·137	71	36748	2044	5·562	17·979	71
72	31670	2118	6·688	14·952	72	34704	2090	6·022	16·606	72
73	29552	2141	7·245	13·803	73	32614	2134	6·543	15·284	73
74	27411	2146	7·829	12·773	74	30480	2161	7·090	14·104	74
75	25265	2148	8·502	11·762	75	28319	2183	7·709	12·972	75
76	23117	2131	9·218	10·848	76	26136	2187	8·368	11·950	76
77	20986	2107	10·040	9·960	77	23949	2180	9·103	10·985	77
78	18879	2062	10·922	9·156	78	21769	2149	9·872	10·130	78
79	16817	2001	11·899	8·404	79	19620	2105	10·729	9·321	79
80	14816	1910	12·891	7·757	80	17515	2035	11·619	8·607	80
81	12906	1803	13·970	7·158	81	15480	1948	12·584	7·947	81
82	11103	1672	15·059	6·640	82	13532	1838	13·580	7·364	82
83	9431	1528	16·202	6·172	83	11694	1716	14·674	6·815	83
84	7903	1375	17·399	5·747	84	9978	1575	15·785	6·335	84
85	6528	1222	18·719	5·342	85	8403	1430	17·018	5·876	85
86	5306	1066	20·090	4·977	86	6973	1277	18·313	5·461	86
87	4240	923	21·769	4·594	87	5696	1123	19·716	5·072	87
88	3317	766	23·093	4·330	88	4573	968	21·168	4 724	88
89	2551	630	24·696	4·049	89	3605	819	22·718	4·402	89
90	1921	505	26·288	3·804	90	2786	676	24·264	4·121	90
91	1416	395	27·895	3·585	91	2110	545	25·829	3·872	91
92	1021	302	29·579	3·381	92	1565	429	27·412	3·648	92
93	719	224	31·154	3·210	93	1136	329	28·961	3·453	93
94	495	162	32·727	3·056	94	807	247	30·607	3·267	94
95	333	114	34·233	2·921	95	560	180	32·143	3·111	95
96	219	78	35·616	2·808	96	380	128	33·684	2·969	96
97	141	52	36·879	2·712	97	252	89	35·317	2·832	97
98	89	33	37·079	2·697	98	163	60	36·810	2·717	98
99	56	21	37·500	2·667	99	103	39	37·864	2·641	99
100	35	14	40·000	2·500	100	64	25	39 062	2·560	100
101	21	8	38·095	2·625	101	39	16	41·026	2·438	101
102	13	5	38·461	2·600	102	23	10	43·478	2·300	102
103	8	3	37 500	2·667	103	13	6	46·154	2·167	103
104	5	2	40·000	2 500	104	7	3	42·857	2·333	104
105	3	2	66·667	1·500	105	4	2	50·000	2·000	105
106	1	1	100·000	1·000	106	2	1	100·000	1·000	106

5 and 10 contain the reciprocals of columns 4 and 9, and represent the specific intensity of life at each age. Male and female life will each be found to attain its highest specific intensity at the age of 14. It will also be seen that male life possesses a much higher specific intensity than female life up to the age of 25 inclusive; from that to the age of 38 the difference is very little, but that generally in favour of male life; and that from 38 upwards to nearly the extreme of life, the scale turns in favour of female life, and the specific intensity is higher throughout. At the age of 50 the two sexes attain their balance, the numbers surviving of each, from the age of 10, being equal. The nature of the specific intensity, in the preceding sense, must be clearly understood to refer to that period of life only to which it is affixed, and not to be any index to the general value of life; for it will be seen that although male life possesses a higher specific intensity up to the age of 38, still female life is of a higher absolute value throughout the whole of the same period.

Table D exhibits the Expectation of Life as deduced from the data already described; and without attempting anything like an elaborate comparison between it and other tables, hitherto regarded as a near approximation to the real measure of life, such observations only will be made as appear to be more intimately connected with the subject of this paper.

It is clear that a table formed from the data at present under consideration, will shew the value of life in the country generally; all classes of society, from the highest to the lowest, being included; and it will therefore serve as a useful standard of comparison with the measure of life in individual classes of society, provided the rate of mortality in those classes can be determined.

In order to convey a general idea of the value of life as represented by Table D, it may be stated that it gives a greater expectation to males throughout the whole range of the table, than is given in the Table at page XIX. of the 5th Report of the Registrar General:

At Age	10	the difference is	·68	of a year.
...	20	...	·81	...
...	30	...	·97	...
...	40	...	·92	...
...	50	...	·83	...
...	60	...	1·00	...
...	70	...	·44	...
...	80	...	·15	...
...	90	...	·15	...

In the Twelfth Annual Report of the Registrar-General he has given a new Life Table, designated by him No. 2, the basis of which, in common with that in his Fifth Report, is the population of 1841, but the Mortality extends over the seven years, 1838–44. The results of this Table differ but little from the above.

[The value

Table D.

Expectation—England and Wales—*Whole Population.*

Age.	Males.	Females.	Age.	Males.	Females.
10	47·7564	48·3826	59	15·1806	16·1552
11	47·1332	47·7648	60	14·5854	15·5320
12	46·4626	47·1065	61	13·9983	14·9137
13	45·7555	46·4175	62	13·4215	14·3022
14	45·0234	45·7140	63	12·8544	13·6994
15	44·1781	44·9950	64	12·2990	13·1086
16	43·5342	44·2855	65	11·7545	12·5300
17	42·8034	43·5937	66	11·2230	11·9648
18	42·0862	42·9171	67	10·7026	11·4128
19	41·3830	42·2533	68	10·1954	10·8750
20	40·6910	41·5982	69	9·7000	10·3504
21	40·0092	40·9482	70	9·2176	9·8409
22	39·3339	40·2991	71	8·7480	9·3455
23	38·6652	39·6519	72	8·2927	8·8665
24	38·0025	39·0068	73	7·8510	8·4026
25	37·3457	38·3635	74	7·4251	7·9559
26	36·6946	37·7218	75	7·0131	7·5248
27	36·0455	37·0817	76	6·6184	7·1116
28	35·3975	36·4427	77	6·2395	6·7153
29	34·7494	35·8048	78	5·8802	6·3378
30	34·0990	35·1671	79	5·5361	5·9772
31	33·4466	34·5297	80	5·2160	5·6355
32	32·7916	33·8919	81	4·9094	5·3106
33	32·1337	33·2541	82	4·6253	5·0031
34	31·4736	32·6149	83	4·3567	4·7109
35	30·8120	31·9750	84	4·1025	4·4351
36	30·1469	31·3312	85	3·8610	4·1726
37	29·4808	30·6867	86	3·6349	3·9258
38	28·8130	30·0390	87	3·4212	3·6938
39	28·1443	29·3877	88	3·2350	3·4781
40	27·4760	28·7330	89	3·0567	3·2778
41	26·8065	28·0742	90	2·8930	3·0944
42	26·1382	27·4125	91	2·7458	2·9256
43	25·4701	26·7479	92	2·6143	2·7703
44	24·8039	26·0809	93	2·4986	2·6276
45	24·1390	25·4120	94	2·3976	2·4950
46	23·4767	24·7420	95	2·3208	2·3750
47	22·8156	24·0703	96	2·2727	2·2632
48	22·1567	23·3985	97	2·1879	2·1587
49	21·4996	22·7263	98	2·1631	2·0644
50	20·8463	22·0545	99	2·1379	1·9757
51	20·1947	21·3834	100	2·1388	1·8750
52	19·5478	20·7137	101	2·0652	1·7564
53	18·9050	20·5461	102	2·0715	1·6304
54	18·2682	19·3821	103	1·9445	1·5000
55	17·6370	18·7220	104	1·6667	1·3571
56	17·0128	18·0682	105	1·2500	1·0000
57	16·3946	17·4236	106	1·0000	·5000
58	15·7842	16·7865	107	·5000	

The value of Female Life, TABLE D, is also higher than Female Life in the Table of the Registrar General; the difference of Expectation in the two Tables being—

At Age	10	the difference is	·57	of a year.
...	20	...	·79	...
...	30	...	·92	...
...	40	...	1·01	...
...	50	...	·98	...
...	60	...	1·12	...
...	70	...	·81	...
...	80	...	·44	...
...	90	...	·32	...

A comparison of the expectation of Male Life in TABLE D with the Carlisle Table, which includes both sexes, will shew a higher value of life in the Carlisle Table up to age 54:

At Age	10	the difference is	1·06	of a year.
...	20	...	·77	...
...	30	...	·24	...
...	40	...	·13	...
...	50	...	·26	and
...	54	they nearly coincide.		

Again, from that age up till 75 the difference is very little, but that generally against the Carlisle Table; and at 75 the Carlisle Table again crosses and maintains a superiority till the extreme of life.

The expectation of Female Life, as shewn in TABLE D, is higher than the expectation of the Carlisle Table after 15 years of age:

At Age	20	the difference being	·14	of a year.
...	30	...	·83	...
...	40	...	1·12	...
...	50	...	·94	...
...	60	...	1·18	...
...	70	...	1·66	...
...	80	...	·13	...
...	88	they nearly coincide, and the Carlisle Table continues higher after that age.		

A comparison of the mean of the expectation of Male and Female Life in TABLE D, with the expectation of the Carlisle Table, produces the following results, namely,

At Age	10	the difference in favour of the Carlisle Table is		·75	of a year.
...	20	...	...	·32	...
...	30	the difference in favour of England & Wales is		·29	...
...	40	...	...	·49	...
...	50	...	...	·34	...
...	60	...	...	·71	...
...	70	...	...	·35	...
Again at	80	the difference in favour of the Carlisle Table is		·09	...
...	90	...	...	·29	...

So that the absolute difference throughout the whole course of both Tables is very small, and the near approximation rather remarkable, considering the very different sources from which the data are derived. For a more minute comparison of those results with several of the best recognised Life Tables, reference is made to the Table in the Appendix, Note I.

Much attention has of late been given to the supposed influence of locality on the duration of life; still no public means have yet been employed to correctly solve the question. For the progress of vital statistics it unfortunately happens, that the public records of this country are kept with very little regard to method or unity of plan. The Report of the Census may certainly in itself be regarded as a very complete document; and perhaps no other country possesses such excellent Mortuary Registers; yet for almost every purpose of exact calculation, both documents are nearly useless. No two things should have been more intimately related in design and classification, than the Census of the People and the Registration of Deaths. Still they seem to have been compiled without any regard to each other. For example, if it were required to compare any two counties in England—a manufacturing with an agricultural county—an inland with a coasting county—in order to determine the relative value of life in the respective populations, it cannot at the present time be done. The Report of the Census Commissioners gives the population for those counties; but on reference to the reports of the Registrar General it is found that the deaths are given for quite a different arrangement of districts. Again, if it be required to compare one district of the Registrar General with another, the same kind of difficulty arises; for, on turning to the Census Report, those districts are in no way recognised. Precisely the same want in unity of plan is to be regretted in respect to the town districts of England, the districts of Census Commissioners constantly differing from those adopted by the Registrar General.

Were these difficulties overcome, it would then be easy to determine the difference of mortality in various districts, in precisely the same manner that the difference of mortality in male and female life has been found in the preceding Table. Another inquiry at least would however still remain, before it could be decided to what extent the difference of mortality was owing to the simple influence or peculiarity of locality itself.

At present it is right to assume, that either employment or occupation—condition in

life, or rank in society—poverty or riches—has as direct an influence on the duration of life, as peculiarity of locality or habitation; for the effect of neither one nor the other of the presumed influencing causes has yet been correctly defined. The truth of this assumption may appear more evident thus:—Suppose that the town of Liverpool were compared with some purely agricultural district, and that a much higher rate of mortality was found to prevail in the former; it would be no more right to assign this result wholly, or indeed any given portion of it, to the badly-conditioned streets and ill-planned houses of Liverpool, than to any other of the supposed causes.

In order to determine the simple influence of locality, like classes in the respective districts must be compared. In a comparison of districts A and B, if it so happened that in A two elements *c* and *d* were found to influence the value of life, while in B one only of those elements existed, the grounds of comparison would evidently be fallacious. Now this is precisely a parallel case to the state of things which exists in comparisons that have frequently been made between the manufacturing towns and the rural districts of England, and between one manufacturing town and another. Causes influencing the duration of life, independent of locality itself, frequently exist in the one, and not in the other; by overlooking which, observers are often led to assign excessive mortality to imaginary causes. If simple elements were compared, errors of this kind would be avoided. Keeping this in view, and referring to the preceding case, let *c* be supposed to represent comfort, and *d* distress. If, comparing comfort in district A with comfort in district B, a greater mortality were found to prevail in the former than in the latter, it would then be right to assume that the remaining elements—ill-ventilated houses, badly-drained streets, and the like—in district A, were not so favourable to life as in district B; but it would have been wrong to draw such a conclusion, had Comfort and Distress in the one district been compared with Comfort only in the other.

It is evident that, in a comparison of the general mortality of any one place with that of another, such errors could not be avoided. It may happen that the prevalence of a particular kind of employment or occupation in the one, which is not common to the other district—but which employment is of an unhealthy nature, or perhaps subject to great fluctuations in prosperity, or probably both combined—may produce an excessive mortality, the cause of which may be attributed to badly-planned dwellings, instead of to poverty and its train of direful consequences.

If it were possible to compare any one class in a given district with the same class under exactly similar circumstances in another district, the only distinction being the difference of district or locality, then it is plain that the influence of locality, if any, would manifest itself.

Again, if different classes of persons in the same locality were compared—for example, those following different employments—the only distinction being difference of employment, then the force of that element, if any, on the duration of life would appear.

In the present paper it is proposed to enter into this question, and to shew if possible

the influence of locality in the manner just described. The effect of employment on health will be treated of, on the present occasion, so far only as may be necessary to solve the question of locality.

About the time of the first edition of this paper going to press, the following correspondence took place with the Registrar-General on a kindred subject to that of the preceding seven paragraphs:—

General Register Office,
26th February, 1845.

Sir,

I fear you may think that I am taking a great liberty in thus intruding upon you; but I hope that you will excuse the trouble I am giving you, when you consider that it is for a public object of very considerable importance.

It has been lately suggested to Her Majesty's Government, that more extended abstracts should be annually laid before Parliament relative to the births, deaths, and marriages registered in accordance with 6th and 7th William IV., c. 86; and I have received instructions to make a Report upon the subject to the Secretary of State for the Home Department.

My object in now troubling you, is to request you to turn your attention to this subject, and to favour me with any suggestions that may occur to you with a view to improvement, feeling assured, from your intimate acquaintance with these matters, that I shall not fail to derive assistance from the recommendations with which you may be pleased to favour me.

For the forms in which the particulars are recorded of each birth, death, and marriage, I beg to refer you to Schedules A, B, and C, in the Act of Parliament above alluded to; and in my Fourth, Fifth, and Sixth Annual Reports will be found the abstracts hitherto made and presented to Parliament.

I want information as to the improvements of which the abstracts are, in your opinion, susceptible, as framed from the entries in the Register Books now established by law, in combination with the returns of the population published in the Reports of the Census' Commissioners; and I wish to know what improvements, without involving any very large additional expenditure, you recommend for immediate adoption, as most urgently required.

I will not upon this occasion ask for your aid and advice with respect to alterations, which you may, perhaps, be disposed to recommend, regarding the forms in which the particulars in the original entries should be registered; nor with respect to original alterations which you may consider it advisable to introduce into any future Act of Parliament amending the present Registration Act; nor will I now allude to improvements which you may suggest relative to the particulars which it may be desirable to record in the next census of 1851,—if you will permit me to do so, I will, in another communication, advert to that subject. At present, I wish for your opinion as to the abstracts which it is most important should be annually given to the public, framed from the returns as at present made.

I have the honour to be, Sir,
Your faithful Servant,
GEORGE GRAHAM,
Registrar-General.

F. G. P. Neison, Esq.,
Medical, &c. Assurance Office,
25, *Pall Mall.*

25, Pall Mall,
22nd March, 1845.

Sir,

In reply to your letter of the 26th ultimo, I beg to suggest a few alterations, which appear to me calculated to improve your Annual Reports as documents of public utility and importance.

In the registration of the "Causes of Death," an improvement would be effected by giving the age at death under each particular disease. This has already been done, to a limited extent, in your Third and Fourth Reports. To determine the value of life in various parts of the county, or in the country generally, it is essential to ascertain the ages at death, and when the progress or extent of any disease is inquired into, it is equally necessary to know the particular terms of life affected by that disease. In some parts of the country, Devon, Suffolk and Norfolk, for example, the population above 60 years of age is about 9 per cent. of the whole; but in Liverpool, Manchester, and Sheffield, the population alive above the same age is about 4·5 per cent., or one-half of the other;—it is therefore plain that apoplexy, or other diseases peculiar to old age, should have a higher ratio to the whole deaths in the former than in the latter, and this would be so, although the ratio of deaths in this disease to the population at given ages were the same; but at the present moment the Medical Inquirer cannot satisfy himself on this point, as the ages at death are not given.

Again, in the district of St. George's, Hanover Square, 36 per cent. of the population is between 15 and 30 years of age; but in Bethnal Green, 26 per cent. only is alive between those ages;—it is therefore evident that the deaths from consumption and other diseases prevalent at that term of life should also be in the same ratio, but if found in a different ratio there should be some means to account for the greater prevalence of the disease in one place than the other; however, as the ages under the head "Cause of Death" are not specified, it is at present impossible to carry out such an inquiry.

It will also be found that, between the ages of 20—40, the ratio of the population in the Metropolis to its whole population exceeds that of the County of Hereford by 32 per cent.; and provided that the ratio of the married population and of births were the same in both districts, the still births and deaths in childbirth should also shew an excess of 32 per cent. on the whole population. For all exact inquiries into the sanitary condition of various districts, as well as for the purposes of Medical science, the proposed change is highly important. It is not enough for Medical Statistics to know that a certain number of deaths has taken place from any given disease, the ages at death must also be known, and it will then be seen at what periods of life particular diseases are most destructive. A clear exhibition of the facts under this aspect would point out the fluctuations and progress of disease, and afford means of applying effective remedial measures. These remarks apply with particular force to the prevalence of epidemics. A reference to the Mortality Bills of Glasgow will shew that within the last 10 years the mortality in mature life in one year has sometimes differed by 125 per cent. from that of another. The advantage of being able to point out the particular diseases producing this most remarkable distinction at given terms of life is evident. So also in England and Wales would the same kind of information be valuable; in fact, unless the ages at death be given, I can see no important use to be made of the simple registrations of the total deaths under a given disease.

There is another improvement coming within the scope of the Registration Act that would be of great advantage in determining the sanitary condition of various districts, and which would at the same time furnish an important element in the remedial Medical measures already alluded to. That is, to specify the particular employment, as well as the "cause of death;"—to Medical science the advantage of this

information is obvious. The age and cause of death viewed in connection with the peculiarity of employment would often lead to important results; and it may be easily shewn that no satisfactory conclusion can be arrived at, in inquiries into the state of the public health, unless the influence of employment be taken into consideration. I have found by an investigation, the results of which are now in the press with a view to publication, that the mortality of some trades at particular ages is from 30 to 40 per cent. above that of others, and it is therefore evident that if any particular town or locality had a preponderance of the unhealthy trades to the exclusion of the more healthy, such circumstance would account for an increased rate of mortality, independent of any peculiar local influence on the duration of life. The alterations suggested would, in this respect, be highly advantageous to the country in affording the means to determine the causes of the increased mortality of various districts, and lead to the removal of the particular conditions which render some trades so much more fatal to life than others.

There is but one other change of any importance which I shall venture to suggest, and that will complete the principal combinations which Schedule B., in the Registration Act, admits of. When the deaths are given for each month, or other division of time, during the year, not only the sex, as in all other cases, but also the age, employment or trade, and cause of death, should be specified for that period of time. This to some may seem of secondary value, but a reference to your own Reports will be a sufficient reply. If the gross number of deaths, in any particular period or season of the year, be given, as at present, in order to determine the influence of climate on the public health, that question is not half answered unless it be also known at what ages the destruction of life has taken place, and what diseases have been the more immediate cause of death.

It appears to me, that with less information than would be given by the improvements suggested, little practical advantage can result from the Registration Act. These improvements are also quite within the spirit, in fact, in the direct terms, of the Act. Place, date, sex, age, employment, and cause of death, are the six facts required, under Schedule B., to be registered of every death, and I have often regretted that the Country had not all the advantages which the Registration Act thus seems intended to convey, and which would be given by a proper exposition of those six facts.

Any minor combinations or arrangements, that might be of interest or public utility, it is unnecessary to allude to, deeming it of primary importance to have all the elementary facts, in the first place, abstracted, leaving to individual inquirers complicated combinations, when the means to satisfy more immediate and important questions are provided.

I do not think it necessary to say anything in respect of Schedules A. and C. The collateral arrangements which should follow the changes now suggested in Schedule B. will be easily affected.

From your letter it does not clearly appear whether I should suggest anything in reference to the enumeration of the population. In your own Reports, the necessity which exists to ascertain the population, at each time of life, in any district, before any useful results can be derived from the registration of deaths, has been clearly illustrated. I therefore think it not out of place to state that, among those giving attention to Vital Statistics, I have repeatedly heard it much complained of that the Report of the Census Commissioners, and your own Reports, should have been compiled with so little regard to each other. It appears to me that no two things should have been more intimately related in design and classification.

If, at this moment, it were required to determine the comparative value of life in any two counties in England, or any two towns in England, there exists no means of accomplishing it. For if the population of any particular place is obtained from the Report of the Census Commissioners,

the deaths, in your own Report, will be found for quite a different arrangement of districts, and *vice versâ*. It would, therefore, be of great public value if means were adopted to remedy this evil, and to render the districts, in some way or other, *coterminous*, or at least to obtain the enumeration of the population, at each term of life, in your own districts, for the period of the last census, and to arrange for the same being done at the next cenus in 1851. The reasons that have been given for the necessity of distinguishing the age at death do equally apply to the enumeration of the population. If the gross population, without distinction of age, were therefore given for each of your districts, that would not answer the purposes contemplated.

The sanitary condition of various districts engages, at the present time, much of the public attention, and it is important that your Reports should afford the means of testing the opinions which many individual inquirers have so readily advanced on limited data and insufficient evidence.

I have the honour to be,

Sir,

Your most obedient Servant,

F. G. P. NEISON.

To The Registrar-General.

It will be found, on referring to the census of 1851, that the improvements suggested have been to a great extent carried out, and, with great judgment, the responsibility of so difficult and arduous an undertaking was entrusted to the Registrar-General and his two eminent and distinguished assistants, Dr. Farr and Mr. Horace Mann. The result of their labours is the most complete and valuable census ever known in this or any other country. It is, however, to be regretted that the occupations of the population with distinction of age for quinquennial periods has not been given in the published Reports for smaller communities than "Registration Counties." The population was so abstracted as to shew the occupations of males and females at quinquennial ages in each of the 624 districts of the country, and the sheets are preserved for future use and reference: the publication of the tables would have involved so large an amount of printing that it was not thought right to increase the bulk of the census' publications, which in their present compressed form, extend over four large closely printed folio volumes.

For the solution of many of the questions alluded to in the preceding letter, "Registration Counties" are too often so extensive, and contain a population of so diversified occupations, as to render the information as now given of but little value in its application to minor districts included within the major division. For example, the West Riding of Yorkshire, containing a population of 1,340,051, includes the important towns of Leeds, Sheffield, Bradford, Halifax, Huddersfield, and Wakefield, with populations varying from 172,270 in the former to 22,057 in the latter; and the East Riding of the same County, having a population of 254,352, includes the Borough of Hull and the City of York—the former with a population of 84,690, the latter with a population of 36,303—two places very dissimilar in the occupations of the inhabitants. In like manner, Lancashire, with a population of 2,067,301, includes Manchester and Salford with a population of 401,321

and Liverpool with a population of 375,955—the former containing 48,344 persons recorded as engaged in "cotton manufacture," and the latter only 1048; so also will it be found that the number described as "seamen, pilots, and others connected with sea "navigation," is 17,898 in the latter, and no more than 163 in the former. It is hence obvious that the distinction of ages, as given for quinquennial terms of life in connection with the occupations of the people for the "Registration Counties," cannot be available for such smaller districts as those just pointed out. This is very much to be lamented, for it is to the great commercial and manufacturing places that the uses above all others of such improvements in the enumeration of the population are particularly applicable and important. At the same time it may be remarked that, as in the census of 1841, the ages were not distinguished for the different occupations; and as the schedules of that enumeration were not re-abstracted by those entrusted with the recent census to admit a comparison of their results with those of 1851, the figures distinguishing the ages of those engaged in different occupations at the latter date will be of little use until the period of next census, when it is to be hoped that the Commissioners then to be appointed will, notwithstanding the additional expense and increased bulk of publication, be enabled to give the country the same kind of information now furnished in respect to "Registration Counties," not only for the "Registration Districts," but for the "Sub-Districts" also. The records preserved in connection with the census of 1851 are not, in their present unpublished condition, available to the public, and seeing the country has already incurred the expense of analysing the various Schedules, the additional cost of printing should not prevent the results from being placed at the disposal of every inquirer into questions which are so important to the national interest.

In regard to the suggestions made in the preceding letter on the subject of the registration of deaths, those familiar with the Reports of the Registrar-General will be aware that they are year after year being gradually carried out, and that the mortuary records of England and Wales are even at the present time by far the most complete, precise, and important in the world.

On the appearance of the Registrar's next Annual Report it will be found to distinguish for several districts of the country the ages at death, the immediate causes, and the occupations followed by the different persons. If such should be done for each District, and if possible for each sub-District also, for every year from the date of last census until the next in 1861, and the improvements in the census itself likewise persevered in, the country will then be put in possession of a body of information of the utmost value, more correct and definite views cannot fail to be disclosed on the nature and extent of the causes which affect the sanitary conditions of great masses of our population, the health and longevity of the people must be speedily improved, and consequently the prosperity, happiness, and moral elevation of all classes advanced and promoted.

DURATION OF LIFE IN VARIOUS CLASSES.

The data to which this part of the inquiry belongs have been derived from two sources. One portion—that relating to the Friendly Societies in England—has been obtained through the kindness of Mr. J. Tidd Pratt; and consists of the Quinquennial Returns for 1836–1840, made under the Friendly Societies Act, 10 Geo. IV. c. 56. § 34, as amended by 4 & 5 Wm. IV. c. 40. § 6. And an inspection of the form of schedule given under that Act will shew the nature and extent of the information which can be derived from this source.

It was considered that Returns from the Friendly Societies in Scotland would form a valuable contribution to Vital Statistics, and at the same time be interesting to compare with the results obtained from English Societies; especially as Mr. Ansell's valuable work had given rise to many curious conjectures on the comparative amount of Sickness in the two countries; the inquiry made by the Highland Society having exhibited a less degree of sickness among the Scotch Societies, than the results of Mr. Ansell's investigation shewed to be prevalent in Societies in England. Accordingly, in 1840, a number of blank schedules were sent to nearly every parish minister in Scotland, with a note requesting him to use his influence with the neighbouring Friendly Societies, to induce them to furnish the information required; but the attempt to procure data in this manner proved an almost complete failure. In 1843 another attempt was made, but on this occasion prizes were offered to those making the best and most complete returns; which had the desired effect of procuring a series of schedules filled up evidently with much care; and although very elaborate, the nicest attention seemed to be given to the minutest detail. These constitute the second source from which the data just referred to are derived.

On the various Schedules on which the elementary facts of the inquiry were written being procured from the different Societies, they were, in order to award the prizes, submitted to the individual scrutiny of Mr. Farr, of the Registrar-General's Office; Mr. Fletcher, Honorary Secretary to the Statistical Society; Dr. Guy, of King's College; and Mr. Phillips, of the Westminster Hospital.

Every Schedule to which the least suspicion attached, or on which any of the elementary facts were deficient, were immediately rejected, and nothing but the most satisfactory records were admitted as a portion of the general data.

As it is proposed to enter into a few points only of the inquiry, in this paper, a form of the Schedule is given, that an idea may be formed of the extent of the information obtained, as well as the combinations of which the varied character of the data is susceptible.

_____ Society, Established in the Year _____ in the Town of _____ County of _____

MEMBERS.						The whole amount of time to which the Member has been entitled to Aliment, including Bed-lying, Walking-about, and every other description of Aliment: during the Years—								The part of that time which he has been entitled to Walking-about Pay only: during the Years—								DEATH.					Date at which the Member ceased to belong to the Society: whether from arrears of Contributions, from Expulsion, or from any other cause except Death.	Number of Attacks of Illness.	Remarks.
Name.	Occupation or Trade.	Date of Birth.	Date of Admission into the Society.	Age at the time of Admission.	Date of becoming a Free Member.	1831		&c.		&c.		1842		1831		&c.		&c.		1842		Date of	Age at	Disease or Cause of	Period sick before Death.					
						Weeks.	Days.	Weeks.	Days.	Weeks.	Days.	Weeks.	Days.	Weeks.	Days.	Weeks.	Days.	Weeks.	Days.	Weeks.	Days.				Weeks.	Days.				

1. When any particular case of Sickness may have commenced in one year, and continued to the following year, care must be taken to ascribe the proper quantity of Sickness to each year.

2. Every Member's name, or initials, must be entered in the Schedule, whether he may have received aliment at any time or not.

3. In filling up the columns of Sickness, Sundays are meant to be included. If it should be more convenient to exclude them, please to state that you have done so.

4. If the Member's correct date of birth, and also his age at admission into the Society, be known, it will be entered as such; if not, his present age, his age at death or at expulsion, as the case may be, must be guessed at or approximated to by the person who fills up the Schedule, and also by any other person who may know the Member in question, and inserted in the column headed "Remarks." The age on the preceding birthday should be taken, if not otherwise expressed.

5. If it be the practice of the Society to distinguish between Bed-lying and Walking-about Pay, care must be taken to fill up the respective columns.

6. The column of Deaths, as well as the column of Members who have been expelled, or who have left the Society, must be filled up with much care.

7. Should it be inconvenient or impossible to furnish the information for any particular column, or columns, it is hoped that the remaining ones will be filled up with as much accuracy as possible.

8. If it should happen that the information given respecting any particular Member stands in need of any explanation, such is to be given in the column headed "Remarks."

9. If the columns for the whole period of twelve years cannot be filled up, please to fill up as many as possible.

10. It will also be important to have an Abstract of the Society's Income and Expenditure filled up in the annexed Form.

11. A copy of the Society's Printed Rules or Regulations will be useful; and if such cannot be forwarded, then a written abstract of the terms of Contribution from Members, and of the benefits or aliments afforded them; with any other information of a useful nature relating to the Society.

12. A copy of the return of *Sickness* and Mortality sent to the Barrister or Advocate appointed to certify the Rules of Friendly Societies, would be very desirable.

13. Insert, in the column headed "Remarks," how many times the Member may have been sick during the period referred to in the adjoining columns; for example, a Member may have experienced, in any one or more years, twenty weeks of sickness, which may have been all one attack of illness, or it may represent three or four different attacks of illness; and the number of attacks is to be stated, which can always be done by referring to the Society's books, and seeing the number of applications he has made for sick allowance.

14. It is also to be kept in view, that when a Member's death is recorded, it should be stated in the columns headed "Disease or Cause of," for what period he was ill in the attack of sickness immediately preceding his death.

Abstract of the Society's Income and Expenditure.

Date of balancing in the respective years.	Amount of Income during the preceding year, from		Amount of Expenditure during the preceding year, on account of		Amount of Stock in hand at each period of balancing.
	Contributions not including Arrears.	Interest of Stock and other Sources.	Aliment in Sickness.	Funeral and other expenses.	
1831					
&c.					
&c.					
1842					

Number of Members in the Society on the _____ day of _____ 1831 _____

... ... _____ &c. _____

... ... _____ &c. _____

... ... _____ 1842 _____

The data were subsequently abstracted on sheets similar to the following, and the results of every Society were kept separate from those of every other. The results of every particular trade or employment were also kept distinct from those of every other occupation.

Schedule on which the Original Facts were Abstracted.—Occupation.

No.	10					11					&c.					&c.					&c.					&c.					99					100					Remarks.
		Sickness.					Sickness.					Sickness.					Sickness.					Sickness.					Sickness.					Sickness.					Sickness.					
	Cases.	Weeks.	Days.	Deaths.		Cases.	Weeks.	Days.	Deaths.		Cases.	Weeks.	Days.	Deaths.		Cases.	Weeks.	Days.	Deaths.		Cases.	Weeks.	Days.	Deaths.		Cases.	Weeks.	Days.	Deaths.		Cases.	Weeks.	Days.	Deaths.		Cases.	Weeks.	Days.	Deaths.	

By this arrangement a means was afforded to measure the precise amount of Sickness and Mortality experienced by any particular Society, the ratio due to each year of life, and also how far its affairs were influenced by the particular trades and occupations of its Members.

All the Societies having been abstracted in this way, the results were afterwards combined in the following manner:—

The Societies belonging to the Rural Districts were placed in one group.

The Societies belonging to Town Districts were placed in another group.

And a third group was formed from those Societies established in the great Towns or Cities. A list of the places composing the respective groups of Rural Districts, Town Districts, and City Districts, is given in Appendix, Note II.

This plan was adopted in preference to a binary arrangement, in order to prevent a purely rural district from being mixed up with some of the smaller towns, and the great city districts with the larger towns.

The results of the first group, or Rural Districts, were then combined as follows. The totals of a given trade were placed on one of the Abstract Sheets; and the totals of the same trade in a second and a third Society, and so forth, were placed next in order on the same sheet, until all the Societies in the Rural Districts of the first county in alphabetical order were exhausted. The sums of those totals were then found, which shewed the amount of sickness and mortality among a certain number of persons at each age and of a given trade in that county. The same trade was carried through the rural districts of every other county in the same manner; and the totals for each county being added together, shewed the general result for that trade in the whole of the rural districts combined. The same trade was carried through the second group, or Town Districts, and also the third group, or City Districts, in precisely the same manner, so that an opportunity was thus afforded, of viewing the comparative degree of health, in the same occupation or employ-

[ment,

Table E.

Trades not Classified.—Rural Districts.—*Males.*

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
10	50	50	...	...	...	11·286	11·286	0·2257	10
11	91		...			72·572			11
12	163		...			180·572			12
13	254	1737	...	4	0·2302	255·858	1373·861	0·8485	13
14	423		1			402·144			14
15	806		3			462·715			15
16	1443		10			1036·572			16
17	2348		20			1870·572			17
18	3826	21408	28	159	0·7427	3046·143	17913·857	0·8367	18
19	5736		42			4921·428			19
20	8055		59			7039·142			20
21	10518		75			9135·856			21
22	13081		96			11065·856			22
23	15232	74586	109	550	0 7333	12714·856	62783·994	0·8417	23
24	17150		127			14151·713			24
25	18605		143			15715·713			25
26	19836		153			17252·713			26
27	20791		150			18295·427			27
28	21672	107009	154	760	0·7102	19914·856	95782·138	0·8950	28
29	22189		152			20343·428			29
30	22521		151			19975·714			30
31	22495		154			19281·857			31
32	22297		150			18901·000			32
33	21840	110107	153	785	0·7129	18020·142	93140·282	0·8459	33
34	21834		159			18192·856			34
35	21641		169			18744·427			35
36	21566		163			19461·570			36
37	21341		169			20218·570			37
38	21313	103887	163	801	0·7710	20797·999	101701·423	0·9789	38
39	20291		156			20663·999			39
40	19376		150			20559·285			40
41	18299		150			19893·570			41
42	17393		136			19747·141			42
43	16232	82763	135	692	0·8361	19453·570	97756·993	1·1811	43
44	15769		141			19322·570			44
45	15070		130			19340·142			45
46	14639		132			19275·428			46
47	14006		140			18744·143			47
48	13455	66447	144	686	1·0324	17796·571	90544·713	1·3626	48
49	12510		132			17345·857			49
50	11837		138			17382·714			50
51	10980		133			17718·857			51
52	10236		139			17994·428			52
53	9485	48361	143	702	1·4515	18670·714	93350·427	1·9302	53
54	9066		146			19254·857			54
55	8594		141			19711·571			55

Table E.—(*continued.*)

Trades not Classified.—Rural Districts.—*Males.*

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
56	8151		145			20159·714			56
57	7768		142			20457·571			57
58	7382	36326	141	698	1·9215	21510·714	106070·284	2·9199	58
59	6789		139			21979·428			59
60	6236		131			21962·857			60
61	5692		122			21534·000			61
62	5121		123			21917·286			62
63	4613	23677	121	596	2·5172	23708·143	124379·429	5·2531	63
64	4286		116			27106·000			64
65	3965		114			30114·000			65
66	3694		117			33347·285			66
67	3453		130			35968·142			67
68	3188	15781	133	653	4·1378	36220 570	176695·852	11·1967	68
69	2870		132			35701·142			69
70	2576		141			35458·713			70
71	2248		138			34905·571			71
72	1931		116			33618·857			72
73	1666	8602	104	551	6·4054	32508·000	160791·141	18·6922	73
74	1472		101			30863·285			74
75	1285		92			28895·428			75
76	1130		85			26211·142			76
77	984		73			23605·142			77
78	855	4203	66	333	7·9229	20783·999	100552·281	23·9239	78
79	688		56			16875·856			79
80	546		53			13076·142			80
81	428		43			10298·856			81
82	339		42			8185·570			82
83	255	1397	35	168	12·0257	6316·428	34925·711	25·0005	83
84	208		31			5376·000			84
85	167		17			4748·857			85
86	139		15			4094·143			86
87	106		11			3155·715			87
88	84	435	8	45	10·3448	2415·715	12497·289	28·7294	88
89	62		6			1733·858			89
90	44		5			1097·858			90
91	28		2			677·001			91
92	21		...			483·001			92
93	14	82	...	2	2·4390	274·715	1717·718	20·9477	93
94	11		...			170·572			94
95	8		...			112·429			95
96	6					52·286			96
97	5					...			97
98	5	25	...	...	...	...	52·286	2·0914	98
99	5					...			99
100	4					...			100
101	3	3							101
	706886		8185		1·1579	1372040·965		1·9410	

Table E.—(*continued.*)

Trades not Classified.—Town Districts.—*Males.*

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
10	15	15	...	...	...	19·000	19·000	1·2666	10
11	48		...			29·857			11
12	109		...			61·571			12
13	206	1454	1	4	0·2751	160·571	1036·712	0·7130	13
14	403		1			270·428			14
15	688		2			514·285			15
16	1017		7			727·285			16
17	1390		8			1070·571			17
18	1826	9315	8	50	0·5367	1465·571	7765·284	0·8336	18
19	2278		13			2041·714			19
20	2804		14			2460·143			20
21	3460		13			3099·429			21
22	4224		19			3837·000			22
23	5076	25473	29	136	0·5338	4598·286	22731·143	0·8907	23
24	5958		33			5290·000			24
25	6755		42			5906·428			25
26	7442		49			6300·713			26
27	8004		53			6524·428			27
28	8422	41592	55	286	0·6876	6788·428	34582·425	0·8314	28
29	8720		62			7237·428			29
30	9004		67			7731·428			30
31	9205		73			8066·000			31
32	9318		75			8458·857			32
33	9381	46837	79	383	0·8177	9080·428	44573·284	0·9516	33
34	9506		80			9288·571			34
35	9427		76			9679·428			35
36	9269		71			9938·571			36
37	9072		81			10061·714			37
38	8815	43221	77	385	0·8907	9653·571	47601·997	1·1013	38
39	8255		78			9144·142			39
40	7810		78			8803·999			40
41	7411		77			8981·284			41
42	7055		66			9543·426			42
43	6710	34220	73	364	1·0637	10186·426	51863·133	1·5155	43
44	6588		74			11242·141			44
45	6456		74			11909·856			45
46	6279		81			12552·428			46
47	6058		89			13032·857			47
48	5840	28781	83	415	1·4419	13391·857	66420·570	2·3077	48
49	5504		79			13637·714			49
50	5100		83			13805·714			50

Table E.—(*continued.*)

Trades not Classified.—Town Districts.—*Males.*

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
51	4704		78			13249·571			51
52	4341		74			12215·285			52
53	3998	20318	75	387	1·9047	11786·857	59499·141	2·9283	53
54	3748		80			11240·000			54
55	3527		80			11007·428			55
56	3286		88			11096·428			56
57	3025		85			11361·285			57
58	2717	13341	82	392	2·9383	10744·856	51563·851	3·8650	58
59	2335		73			9769·141			59
60	1978		64			8592·141			60
61	1699		53			7815·570			61
62	1462		56			7772·428			62
63	1268	6673	51	252	3·7764	8158·428	43278·569	6·4856	63
64	1163		46			9176·143			64
65	1081		46			10356·000			65
66	978		45			10969·571			66
67	867		35			10864·285			67
68	782	3847	38	207	5·3808	10746·142	50466·567	13·1184	68
69	665		43			9632·427			69
70	555		46			8254·142			70
71	470		41			7573·285			71
72	410		42			7070·142			72
73	354	1830	39	183	10·0000	6629·714	34900·569	19·0713	73
74	315		33			6746·000			74
75	281		28			6881·428			75
76	247		26			6716·571			76
77	207		22			6218·428			77
78	170	898	17	89	9·9109	5596·142	28221·140	31·4266	78
79	146		14			5088·142			79
80	128		10			4601·857			80
81	112		11			3899·714			81
82	101		12			3487·000			82
83	89	439	11	55	12·5284	3107·000	15505·715	35·3205	83
84	76		10			2720·572			84
85	61		11			2291·429			85
86	48		9			2010·572			86
87	36		6			1610·715			87
88	27	140	6	29	20·7142	1189·001	6033·575	43·0969	88
89	18		5			754·715			89
90	11		3			468·572			90
91	6		2			256·429			91
92	2	8	1	3	37·5000	93·286	349·715	43·7143	92
	278402		3620		1·3003	566412·390		2·0309	

Table E.—(*continued.*)

Trades not Classified.—City Districts.—*Males.*

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
10	...	...	...	...	...	...	...	...	10
11	...								11
12	...								12
13	...	10	...	...	...	...	...	...	13
14	3								14
15	7								15
16	12					...			16
17	23					...			17
18	56	443	...	...	...	10·000	153·000	0·3453	18
19	113					36·143			19
20	239					106·857			20
21	450		1			344·571			21
22	798		5			615·999			22
23	1236	6684	7	44	0·6682	975·285	5904·709	0·8968	23
24	1798		14			1720·570			24
25	2402		17			2248·284			25
26	3047		22			2901·427			26
27	3717		29			3720·713			27
28	4395	21640	40	196	0·9057	4670·141	23100·565	1·0674	28
29	4972		47			5390·713			29
30	5509		58			6417·571			30
31	5903		62			6851·428			31
32	6130		57			7087·000			32
33	6248	31086	64	330	1·0615	7218·000	36180·285	1·1638	33
34	6380		69			7381·286			34
35	6425		78			7642·571			35
36	6381		80			8072·857			36
37	6271		81			8102·571			37
38	6146	30333	78	383	1·2626	8208·714	40876·285	1·3475	38
39	5878		74			8262·714			39
40	5657		70			8229·429			40
41	5478		76			8144·857			41
42	5329		84			8645·428			42
43	5097	25428	84	409	1·6084	8654·857	41823·427	1·6447	43
44	4907		85			8366·857			44
45	4617		80			8011·428			45
46	4419		79			7991·428			46
47	4006		74			7752·428			47
48	3758	18857	66	332	1·7606	7696·285	38926·425	2·0642	48
49	3475		59			7779·142			49
50	3199		54			7707·142			50

Table E.—(*continued.*)

Trades not Classified.—City Districts.—*Males.*

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
51	2966		53			7567·428			51
52	2722		54			7303·285			52
53	2460	12452	57	275	2·2084	7047·999	35632·710	2·8616	53
54	2247		58			6968·999			54
55	2057		53			6774·999			55
56	1847		43			6308·571			56
57	1663		39			6149·571			57
58	1494	7459	32	181	2·4266	6051·428	29588·140	3·9667	58
59	1312		30			5772·285			59
60	1143		37			5306·285			60
61	1004		37			5017·570			61
62	869		31			4477·570			62
63	743	3823	31	152	3·9759	3938·713	20236·565	5·2933	63
64	644		29			3471·856			64
65	563		21			3330·856			65
66	490		19			3042·142			66
67	417		23			2789·142			67
68	410	2027	26	112	5·5254	2736·142	13813·710	6·8148	68
69	364		33			2645·142			69
70	316		21			2601·142			70
71	278		22			2716·428			71
72	230		17			2890·143			72
73	183	988	13	76	7·6923	2821·286	14504·286	14·6804	73
74	157		12			2885·429			74
75	140		12			3191·000			75
76	123		10			3461·857			76
77	116		10			3823·428			77
78	111	525	12	57	10·8571	3913·714	17821·427	33·9455	78
79	97		13			3660·428			79
80	78		12			2962·000			80
81	59		10			2225·000			81
82	40		8			1466·286			82
83	28	166	5	29	17·4698	1037·000	6158·286	37·0981	83
84	21		3			742·000			84
85	18		3			688·000			85
86	14		3			550·000			86
87	10		2			372·000			87
88	6	34	2	9	26·4705	216·000	1258·000	37·0000	88
89	3		1			112·000			89
90	1		1			8·000			90
	161955		2585		1·5971	325977·820		2·0140	

Table E.—(*continued.*)

Trades not Classified.—Rural, Town, and City Districts.—*Males.*

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
10	65	65	...	...	...	30·286	30·286	0·4659	10
11	139		...			102·429			11
12	272		...			242·143			12
13	460	3201	1	8	0·2499	416·429	2410·573	0·7530	13
14	829		2			672·572			14
15	1501		5			977·000			15
16	2472		17			1763·857			16
17	3761		28			2941·143			17
18	5708	31166	36	209	0·6706	4521·714	25832·141	0·8288	18
19	8127		55			6999·285			19
20	11098		73			9606·142			20
21	14428		89			12579·856			21
22	18103		120			15518·856			22
23	21544	106743	145	730	0·6838	18288·427	91419·850	0·8564	23
24	24906		174			21162·284			24
25	27762		202			23870·427			25
26	30325		224			26454·856			26
27	32512		232			28540·570			27
28	34489	170241	249	1242	0·7295	31373·428	153465·139	0·9014	28
29	35881		261			32971·571			29
30	37034		276			34124·714			30
31	37603		289			34199·285			31
32	37745		282			34446·857			32
33	37469	188030	296	1498	0·7966	34318·571	173893·855	0·9248	33
34	37720		308			34862·714			34
35	37493		323			36066·428			35
36	37216		314			37473·000			36
37	36684		331			38382·857			37
38	36274	177441	318	1569	0·8786	38660·285	190179·711	1·0718	38
39	34424		308			38070·856			39
40	32843		298			37592·713			40
41	31188		303			37019·713			41
42	29777		286			37935·998			42
43	28039	142411	292	1465	1·0287	38294·856	191443·567	1·3443	43
44	27264		300			38931·571			44
45	26143		284			39261·429			45
46	25337		292			39819·286			46
47	24070		303			39529·429			47
48	23053	114085	293	1433	1·2571	38884·714	195891·714	1·7185	48
49	21489		270			38762·714			49
50	20136		275			38895·571			50
51	18650		264			38535·856			51
52	17299		267			37512·999			52
53	15943	81131	275	1364	1·6812	37505·571	188482·281	2·3231	53
54	15061		284			37463·856			54
55	14178		274			37463·999			55

TABLE E.—(*continued.*)

TRADES NOT CLASSIFIED.—RURAL, TOWN, AND CITY DISTRICTS.—*Males.*

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
56	13284		276			37564·714			56
57	12456		266			37968·428			57
58	11593	57126	255	1271	2·2249	38306·999	187222·283	3·2773	58
59	10436		242			37520·857			59
60	9357		232			35861·285			60
61	8395		212			34367·142			61
62	7452		213			34167·285			62
63	6624	34173	203	1000	2·9262	35805·285	187894·567	5·4983	63
64	6093		191			39753·999			64
65	5609		181			43800·856			65
66	5162		181			47358·999			66
67	4767		188			49621·571			67
68	4380	21655	197	972	4·4885	49702·857	240976·141	11·1279	68
69	3899		198			47978·714			69
70	3447		208			46314·000			70
71	2996		201			45195·285			71
72	2571		175			43579·142			72
73	2203	11420	156	810	7·0928	41958·999	210195·995	18·4059	73
74	1944		146			40494·713			74
75	1706		132			38967·856			75
76	1500		121			36389·571			76
77	1307		105			33646·999			77
78	1136	5626	95	479	8·5140	30293·856	146594·853	26·0566	78
79	931		83			25624·428			79
80	752		75			20639·999			80
81	599		64			16423·570			81
82	480		62			13138·856			82
83	372	2002	51	252	12·5874	10460·428	56589·711	28·2665	83
84	305		44			8838·571			84
85	246		31			7728·286			85
86	201		27			6654·715			86
87	152		19			5138·429			87
88	117	609	16	83	13·6289	3820·714	19788·857	32·4940	88
89	83		12			2600·571			89
90	56		9			1574·428			90
91	34		4			933·428			91
92	23		1			576·286			92
93	14	90	...	5	5·5555	274·715	2067·430	22·9714	93
94	11		...			170·572			94
95	8		...			112·429			95
96	6					52·286			96
97	5					...			97
98	5	25	...	...	...	...	52·286	2·0914	98
99	5					...			99
100	4					...			100
101	3	3	...	...	...	...	...	...	101
	1147243		14390		1·2544	2264431·240		1·9740	

ment, in the three districts referred to. Those three districts were next combined, to give the general results for that trade without regard to locality. A second trade was taken up in the like manner, and carried through precisely the same steps, and so also were other trades until all were exhausted. The totals of the various trades in the Rural Districts were then combined, giving the general results for that district without regard to occupation, and so on with each of the other districts; and the combination of these last three gave of course the general results, without regard to either trade or locality.

All the possible combinations of those elements of the data being thus made, the next step was to exhibit the results in a convenient form, from which to make useful deductions. Tables were therefore formed, shewing the total number of persons, at every year of life over which the observations extend—the number of deaths among them yearly—and the amount of sickness yearly, expressed in weeks and decimals of a week. In the same Tables are also given the same facts for quinquennial periods of life, also the rate of mortality per cent., and the average amount of sickness per annum to each person.

As these observations extend over upwards of 400 different trades or occupations, the examination of each under the varied combinations described, would involve the consideration of so immense a number of Tables, as would evidently perplex the present inquiry. Such only will therefore be brought forward as seem to bear distinctly on the more immediate question, What is the influence of Locality on Health and on the Duration of Life?

Table E, one of the class just referred to, will be useful in pointing out the distinction in the rates of Mortality in quinquennial periods of life, between the Male Population in the Rural, Town and City Districts, and for minute purposes of detail will no doubt afford many interesting illustrations; but on the present occasion a more extended and general view of the results is necessary, and an inspection of Table F will therefore be of more importance. This Table is formed from Table E, in precisely the same manner that Table C was formed from Table B. On inspection of the results under the head "Rural Districts," it will be seen that the highest Specific Intensity is attained at the youngest ages in the Table, and that it decreases up to Age 20, from which Age up to 31 it increases, and then decreases gradually till near the extreme of life. A comparison of the Specific Intensity as given in this Table, with the general result for the Male Population in England and Wales as set forth in Table C, will shew a higher intensity of life through the whole range of the Table, maintaining at the same time a very remarkable parallelism.

It will be seen that the Specific Intensity

At Age	20	in Table C is as high as at Age		39	in Table F (Rural Districts)
...	30	...	...	47	...
...	40	...	...	50	...
...	50	...	...	55	...
...	60	...	...	63	...
...	70	...	...	71	...

[An approximating

Table F.

Trades not Classified.—Rural Districts.—*Males.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	230	·230	434·783	56	69171	1199	1·734	57·676
11	99770	229	·230	434·783	57	67972	1246	1·833	54·555
12	99541	249	·250	400·000	58	66726	1293	1·937	51·626
13	99292	289	·291	343·643	59	65433	1339	2·046	48·876
14	99003	349	·353	283·286	60	64094	1384	2·160	46·296
15	98654	429	·435	229·885	61	62710	1429	2·279	43·879
16	98225	527	·537	186·212	62	61281	1495	2·439	41·004
17	97698	605	·619	161·551	63	59786	1578	2·640	37·879
18	97093	660	·680	147·059	64	58208	1678	2·882	34·698
19	96433	694	·720	138·890	65	56530	1789	3·165	31·596
20	95739	708	·739	135·318	66	54741	1910	3·489	28·661
21	95031	700	·737	135·685	67	52831	2028	3·839	26·048
22	94331	692	·734	136·240	68	50803	2141	4·215	23·725
23	93639	685	·731	136·799	69	48662	2246	4·616	21·664
24	92954	676	·727	137·552	70	46416	2341	5·044	19·825
25	92278	667	·723	138·313	71	44075	2423	5·498	18·188
26	91611	659	·719	139·082	72	41652	2466	5·921	16·889
27	90952	650	·715	139·860	73	39186	2474	6·314	15·838
28	90302	643	·712	140·449	74	36712	2452	6·678	14·974
29	89659	637	·711	140·647	75	34260	2402	7·012	14·261
30	89022	633	·711	140·647	76	31858	2330	7·315	13·670
31	88389	628	·711	140·647	77	29528	2283	7·730	12·936
32	87761	627	·714	140·056	78	27245	2250	8·257	12·111
33	87134	626	·719	139·082	79	24995	2223	8·894	11·243
34	86508	628	·726	137·741	80	22772	2196	9·644	10·369
35	85880	632	·736	135·870	81	20576	2153	10·464	9·560
36	85248	637	·747	133·869	82	18423	2035	11·045	9·057
37	84611	642	·759	131·752	83	16388	1866	11·387	8·779
38	83969	648	·772	129·534	84	14522	1669	11·490	8·703
39	83321	653	·784	127·551	85	12853	1459	11·353	8·810
40	82668	659	·797	125·470	86	11394	1255	11·017	9·074
41	82009	664	·810	123·457	87	10139	1127	11·115	9·001
42	81345	674	·828	120·773	88	9012	1064	11·809	8·467
43	80671	687	·852	117·371	89	7948	1041	13·100	7·633
44	79984	704	·880	113·636	90	6907	1023	14·809	6·752
45	79280	725	·914	109·409	91	5884	1018	17·314	5·777
46	78555	749	·953	104·931	92	4866	982	20·173	4·958
47	77806	779	1·001	99·900	93	3884	912	23·476	4·261
48	77027	816	1·059	94·429	94	2972	821	27·625	3·621
49	76211	857	1·125	88·889	95	2151	706	32·826	3·046
50	75354	904	1·200	83·333	96	1445	565	39·132	2·555
51	74450	956	1·284	77·882	97	880	386	47·046	2·125
52	73494	1007	1·370	72·993	98	494	285	57·777	1·731
53	72487	1057	1·458	68·587	99	209	138	66·037	1·514
54	71430	1106	1·548	64·599	100	71	71	85·000	1·176
55	70324	1153	1·640	60·976					

TABLE F.—*(continued.)*

TRADES NOT CLASSIFIED.—TOWNS.—*Males.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	275	·275	363·636	56	65638	1657	2·524	39·620
11	99725	274	·275	363·636	57	63981	1742	2·723	36·724
12	99451	283	·285	350·877	58	62239	1815	2·916	34·294
13	99168	303	·306	326·797	59	60424	1871	3·097	32·289
14	98865	333	·337	296·736	60	58553	1916	3·273	30·553
15	98532	373	·379	263·852	61	56637	1948	3·440	29·036
16	98159	424	·432	231·481	62	54689	1990	3·639	27·480
17	97735	462	·473	211·416	63	52699	2039	3·868	25·853
18	97273	491	·505	198·020	64	50660	2091	4·128	24·225
19	96782	508	·525	190·476	65	48569	2146	4·418	22·635
20	96274	515	·535	186·916	66	46423	2130	4·739	21·101
21	95759	512	·535	186·916	67	44293	2294	5·180	19·305
22	95247	516	·540	185·185	68	41999	2412	5·742	17·415
23	94731	523	·552	181·159	69	39587	2544	6·425	15·564
24	94208	538	·571	175·131	70	37043	2678	7·228	13·835
25	93670	557	·595	168·067	71	34365	2801	8·152	12·267
26	93113	583	·626	159·744	72	31564	2805	8·888	11·251
27	92530	607	·656	152·439	73	28759	2713	9·435	10·599
28	91923	630	·685	145·985	74	26046	2551	9·794	10·210
29	91293	651	·713	140·252	75	23495	2341	9·964	10·036
30	90642	671	·740	135·135	76	21154	2104	9·946	10·054
31	89971	689	·766	130·548	77	19050	1912	10·037	9·960
32	89282	705	·790	126·582	78	17138	1754	10·235	9·775
33	88577	718	·811	123·305	79	15384	1622	10·542	9·488
34	87859	729	·830	120·482	80	13762	1508	10·957	9·124
35	87130	738	·847	118·064	81	12254	1407	11·481	8·711
36	86392	744	·861	116·144	82	10847	1326	12·227	8·176
37	85648	754	·880	113·636	83	9521	1256	13·196	7·581
38	84894	766	·902	110·865	84	8265	1189	14·388	6·949
39	84128	782	·929	107·643	85	7076	1118	15·802	6·329
40	83346	800	·960	104·167	86	5958	1036	17·439	5·734
41	82546	821	·994	100·603	87	4922	956	19·420	5·149
42	81725	847	1·037	96·432	88	3966	864	21·746	4·598
43	80878	880	1·088	91·912	89	3102	757	24·415	4·097
44	79998	918	1·147	87·184	90	2345	643	27·428	3·646
45	79080	959	1·213	82·440	91	1702	524	30·785	3·249
46	78121	1008	1·290	77·519	92	1178	396	33·584	2·978
47	77113	1056	1·369	73·046	93	782	280	35·829	2·791
48	76057	1104	1·452	68·871	94	502	188	37·518	2·665
49	74953	1152	1·537	65·062	95	314	123	39·287	2·545
50	73801	1201	1·627	61·463	96	191	78	40·995	2·439
51	72600	1248	1·719	58·174	97	113	49	43·643	2·292
52	71352	1309	1·835	54·496	98	64	33	50·913	1·964
53	70043	1382	1·973	50·684	99	31	16	51·307	1·948
54	68661	1465	2·134	46·860	100	15	15	75·000	1·333
55	67196	1558	2·318	43·141					

TABLE F.—(*continued.*)

TRADES NOT CLASSIFIED.—CITIES.—*Males.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	396	·3961	252·525	56	58620	1371	2·3393	42·753
11	99604	395	·3961	252·525	57	57249	1395	2·4361	41·051
12	99209	401	·4038	247·525	58	55854	1445	2·5863	38·669
13	98808	414	·4193	238·664	59	54409	1518	2·7896	35·842
14	98394	435	·4426	225·734	60	52891	1611	3·0463	32·830
15	97959	464	·4736	210·971	61	51280	1721	3·3561	29·797
16	97495	499	·5123	195·313	62	49559	1817	3·6660	27·278
17	96996	545	·5511	181·488	63	47742	1898	3·9759	25·151
18	96451	569	·5900	169·492	64	45844	1965	4·2858	23·332
19	95882	596	·6212	161·031	65	43879	2017	4·5957	21·758
20	95286	614	·6446	155·039	66	41862	2054	4·9056	20·383
21	94672	627	·6603	151·512	67	39808	2086	5·2402	19·084
22	94045	637	·6777	147·493	68	37722	2112	5·5995	17·860
23	93408	651	·6967	143·472	69	35610	2131	5·9832	16·714
24	92757	673	·7252	137·931	70	33479	2140	6·3921	15·644
25	92084	703	·7632	131·062	71	31339	2139	6·8255	14·652
26	91181	739	·8107	123·305	72	29200	2131	7·2988	13·701
27	90442	770	·8509	117·509	73	27069	2115	7·8120	12·801
28	89672	793	·8839	113·122	74	24954	2087	8·3651	11·954
29	88879	808	·9095	110·011	75	22867	2049	8·9582	11·163
30	88071	817	·9280	107·759	76	20818	1997	9·5911	10·426
31	87254	837	·9591	104·275	77	18821	1950	10·3620	9·652
32	86417	861	·9961	100·402	78	16871	1902	11·2708	8·873
33	85556	889	1·0389	96·246	79	14969	1844	12·3175	8·117
34	84667	921	1·0875	91·996	80	13125	1772	13·5021	7·407
35	83746	956	1·1419	87·564	81	11353	1675	14·8247	6·748
36	82790	979	1·1821	84·602	82	9678	1572	16·2427	6·158
37	81811	1005	1·2281	81·433	83	8106	1439	17·7563	5·631
38	80806	1035	1·2799	78·125	84	6667	1291	19·3654	5·165
39	79771	1067	1·3375	74·794	85	5376	1133	21·0700	4·746
40	78704	1103	1·4009	71·377	86	4243	970	22·8702	4·373
41	77601	1141	1·4700	68·027	87	3273	812	24·7975	4·032
42	76460	1171	1·5314	65·360	88	2461	661	26·8519	3·724
43	75289	1193	1·5851	63·092	89	1800	523	29·0335	3·445
44	74096	1209	1·6310	61·312	90	1277	400	31·3423	3·191
45	72887	1217	1·6692	59·916	91	877	296	33·7782	2·960
46	71670	1218	1·6997	58·823	92	581	208	35·8437	2·790
47	70452	1227	1·7419	57·405	93	373	140	37·5389	2·664
48	69225	1243	1·7960	55·679	94	233	91	38·8636	2·573
49	67982	1266	1·8619	53·706	95	142	57	39·8180	2·511
50	66716	1294	1·9397	51·546	96	85	34	40·4020	2·475
51	65422	1328	2·0292	49·285	97	51	22	44·1099	2·267
52	64094	1352	2·1096	47·393	98	29	15	51·1463	1·955
53	62742	1368	2·1808	45·851	99	14	8	51·3067	1·949
54	61374	1377	2·2428	44·583	100	6	6	75·0000	1·333
55	59997	1377	2·2956	43·554					

Table F.—(*continued.*)

Trades not Classified.—Rural, Town, and City Districts.—*Males.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	250	·2499	400·000	56	66509	1335	2·0074	49·825
11	99750	249	·2499	400·000	57	65174	1383	2·1224	47·125
12	99501	265	·2667	374·532	58	63791	1431	2·2437	44·563
13	99236	298	·3004	333·333	59	62360	1479	2·3714	42·176
14	98938	347	·3508	284·900	60	60881	1525	2·5054	39·920
15	98591	412	·4181	239·234	61	59356	1570	2·6456	37·793
16	98179	493	·5022	199·203	62	57786	1630	2·8203	35·461
17	97686	557	·5701	175·439	63	56156	1701	3·0295	33·014
18	97129	604	·6216	160·771	64	54455	1782	3·2730	30·553
19	96525	634	·6568	152·207	65	52673	1871	3·5511	28·161
20	95891	648	·6758	147·929	66	50802	1963	3·8635	25·887
21	95243	646	·6785	147·493	67	48839	2060	4·2177	23·708
22	94597	646	·6824	146·628	68	46779	2158	4·6135	21·673
23	93951	646	·6876	145·349	69	44621	2254	5·0509	19·798
24	93305	648	·6942	144·092	70	42367	2343	5·5301	18·083
25	92657	650	·7020	142·450	71	40024	2422	6·0510	16·526
26	92007	654	·7112	140·647	72	37602	2453	6·5246	15·326
27	91353	659	·7212	138·696	73	35149	2443	6·9508	14·386
28	90694	664	·7320	136·612	74	32706	2397	7·3296	13·643
29	90030	670	·7437	134·409	75	30309	2322	7·6612	13·053
30	89360	676	·7563	132·275	76	27987	2224	7·9455	12·586
31	88684	683	·7697	129·870	77	25763	2148	8·3358	11·996
32	88001	690	·7837	127·551	78	23615	2086	8·8322	11·322
33	87311	697	·7983	125·313	79	21529	2031	9·4347	10·598
34	86614	705	·8136	122·850	80	19498	1982	10·1433	9·862
35	85909	713	·8294	120·627	81	17516	1919	10·9580	9·124
36	85196	721	·8458	118·203	82	15597	1817	11·6514	8·584
37	84475	731	·8649	115·607	83	13780	1684	12·2236	8·183
38	83744	743	·8868	112·740	84	12096	1533	12·6744	7·893
39	83001	756	·9113	109·769	85	10563	1374	13·0040	7·692
40	82245	772	·9386	106·496	86	9189	1214	13·2123	7·570
41	81473	789	·9686	103·199	87	7975	1118	14·0171	7·138
42	80684	808	1·0018	99·001	88	6857	1057	15·4183	6·485
43	79876	829	1·0380	96·339	89	5800	1010	17·4160	5·740
44	79047	852	1·0775	92·850	90	4790	958	20·0102	4·997
45	78195	876	1·1200	89·286	91	3832	889	23·2008	4·310
46	77319	901	1·1657	85·763	92	2943	783	26·5925	3·761
47	76418	932	1·2192	81·967	93	2160	644	29·8333	3·352
48	75486	967	1·2806	78·064	94	1516	501	33·0399	3·289
49	74519	1006	1·3497	74·074	95	1015	369	36·3588	2·750
50	73513	1049	1·4267	70·077	96	646	256	39·6498	2·522
51	72464	1095	1·5115	66·137	97	390	176	45·1555	2·215
52	71369	1143	1·6011	62·461	98	214	113	52·9127	1·890
53	70226	1191	1·6955	58·997	99	101	62	61·3067	1·631
54	69035	1239	1·7947	55·710	100	39	39	75·0000	1·333
55	67796	1287	1·8986	52·659					

An approximating value taking place up to about this period, after which they again diverge to near the extreme of life.

The population existing at Age 10 in Table C is halved between ages 62-3; while in Table F (Rural Districts) the same result is not determined till ages 68-9;—shewing under this aspect a superior vitality of six years.

If the results in Table F for the Town Districts be now inspected, it will be seen that the Specific Intensity decreases in a regular series, from the beginning to the extreme of the Table. It will also appear that the Specific Intensity is higher than Male Life in Table C up to Age 52, and from that to age 76 it is less. From the latter age to the extreme of life, they cross each other. The following are the ages at which the corresponding Specific Intensities in Both Tables are nearly equal.

Age 20 in C	corresponds	with	Age 31	in F	(Town Districts)
... 30	...	...	41	...	
... 40	...	...	45	...	
... 50	...	...	50	...	
... 60	...	...	58	...	
... 70	...	...	68	...	
... 80	...	...	82	...	

In Table F (Town Districts) it will be seen that half the population disappears between ages 64-5, and it has been shewn that in Table C the same result takes place at ages 62-3.

Turning next to the results for the City Districts in Table F, it will be seen that the Specific Intensity decreases from the earliest age to the other extreme of the Table, in a uniform series. In this Table it will also appear, that from the age of 10 to 33 there is a higher Specific Intensity than in Table C; and from 33 to the extreme of life, the Specific Intensity in the City Districts of Table F is less than in the Male Life of Table C, which represents the general results for England and Wales. The following will shew the ages corresponding to equal specific intensities in both Tables:—

Age 20 in C	corresponds	nearly with	age 25	in F	(City Districts)
... 30	...	...	33	...	
... 40	...	...	37	...	
... 50	...	...	46	...	
... 60	...	...	59	...	
... 70	...	...	69	...	
... 80	...	...	79	...	

Half of the population, it will be seen in Table F (City Districts), has died off betwen the

ages of 61 and 62, while among Males in England and Wales that happened at ages 62 and 63; being in this instance one year in favour of the Table for the General Results of the Country.

Taking a view of the three Districts respectively, as given in Table F, in conjunction with Table C, it will be seen that there is

A higher Specific Intensity in the Rural Districts up to the extreme of Life, than in Table C,
... ... Town Districts up to the Age of 52 ...
... ... City ... ... 33 ...

From this it would appear, that the lower the age of equal Specific Intensity, the worse the class of lives to which it refers. Another comparison of these three classes of results with Table C will shew the following series of Differences for the corresponding ages of equal Specific Intensity:—

Age.	Rural Districts.	Town Districts.	City Districts.
20	19	11	5
30	17	11	3
40	10	5	3
50	5	0	— 4
60	3	— 2	— 1
70	1	— 2	— 1
Sums of the series of differences	55	23	5

This arrangement of the differences of corresponding periods of equal Specific Intensity also points out a gradual approximation to lower numbers, moving from the Rural towards the City Districts. And a third illustration of the same fact will be found in comparing the periods at which the equation of life is determined for age 10. It is in—

Table C.	F—Rural Districts.	F—Town Districts.	F—City Districts.
At Ages 62—3	68—9	64—5	61—2
difference	6 years.	2 years.	— 1 year.

As before stated, the illustrations drawn from the Specific Intensity must be understood to have reference to the identical periods only of life at which the comparisons are made, and not to the absolute value of life in any of the classes. It will, however, at all times, be found important to keep in view the specific intensity of such Tables, as it affords the readiest means to discover those periods at which any peculiar change or difference in the condition of life is taking place. Various diseases have a maximum or minimum effect in destroying life at certain periods; and if a change to a higher specific intensity were found to take place at any given period, the diseases peculiar to that period should be falling from their maximum towards the minimum.

In the three Districts now under consideration, it appears that in all except one, the Specific Intensity uniformly decreased from the beginning to the end of the Table; but in the Rural Districts the Specific Intensity was found to increase from ages 20–31. Some change, either in the Rural Districts, or uniformly in the two others, must therefore have taken place in the causes affecting the duration of life at that period; and if the nature of this paper led to an examination of the diseases generally prevalent at the same period, the probability is that Consumption and Diseases of the Chest would be found less malignant at that term of life, in relation to the preceding and subsequent periods of life, in the Rural than in either the Town or City Districts.

The next arrangement of the data to which reference will be made, is the "After-"lifetime," or Expectation of Life. This mode of expressing the Duration of Life is certainly that which is of the most interest to society; for it points out the average number of years which one member of the community with another participates in the pleasures and cares of life. The Expectation of Life is often confounded with the chance of living an equivalent number of years; but the distinction will be subsequently explained.

In Table G will be found the Expectation of Life for each of the three districts, and also the General Results for those three combined. A comparison of the expectation under the head "Rural Districts," with the expectation for Males in England and Wales, as given in Table D, will shew a much higher value of life in the Rural Districts throughout the whole range of the Table. At age 10 the difference is 5·5 years in favour of the Rural Districts, at 30 it is 4·3 years, and at 60 the difference is 2·1 years. The following arrangement of the results of the two tables, at decennial periods, will convey a general idea of their relative values of life:—

Age.	EXPECTATION.		Difference in favour of the Rural Districts.	
	Rural Districts.	England and Wales.	In Years.	Per Cent.
20	45·3550	40·6910	4·6640	11·462
30	38·4073	34·0990	4·3083	11·191
40	30·9724	27·4760	3·4964	12·725
50	23·4700	20·8463	2·6237	12·585
60	16·6524	14·5854	2·0670	14·171
70	10·9124	9·2176	1·6948	18·386

A comparison of the results for the Town Districts, will shew a superior expectation up to Age 35, after which period the expectation is in favour of Male Life, in the General Table for England and Wales. The following Abstract shews the results for decennial periods.

[The Expectation

Table G.

Expectation.—Trades not Classified.—*Males.*

Age.	Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Age.	Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.
10	53·2581	50·5373	47·9129	51·8097	56	19·2867	16·0651	16·2599	18·2005
11	52·3797	49·6753	47·1014	50·9383	57	18·6181	15·4682	15·6373	17·5630
12	51·4638	48·8108	46·2870	50·0646	58	17·9163	14·8871	15·0154	16·9330
13	50·6269	47·9486	45·4728	49·1969	59	17·3014	14·3193	14·4009	16·3101
14	49·7733	47·0941	44·6620	48·3436	60	16·6524	13·7608	13·7685	15·6942
15	48·9480	46·2515	43·8482	47·5120	61	16·0089	13·2095	13·2177	15·0845
16	48·1593	45·4254	43·0645	46·7093	62	15·3705	12·6622	12·6593	14·4808
17	47·4163	44·6203	42·2834	45·9425	63	14·7424	12·1215	12·1221	13·8866
18	46·7086	43·8298	41·5195	45·2031	64	14·1284	11·5892	11·6033	13·3047
19	46·0249	43·0496	40·7630	44·4828	65	13·5330	11·0666	11·1005	12·7379
20	45·3550	42·2742	40·0148	43·7736	66	12·9589	10·5551	10·6113	12·1886
21	44·6890	41·4988	39·2711	43·0680	67	12·4093	10·0386	10·1330	11·6585
22	44·0170	40·7192	38·5295	42·3587	68	11·8847	9·5596	9·6657	11·1498
23	43·3385	39·9383	37·7889	41·6465	69	11·3856	9·1116	9·2093	10·6649
24	42·6543	39·1572	37·0506	40·9314	70	10·9124	8·7030	8·7636	10·2057
25	41·9631	38·5540	36·3177	40·2141	71	10·4654	8·3423	8·3279	9·7739
26	41·2649	37·6059	35·6725	39·4947	72	10·0451	8·0382	7·9013	9·3712
27	40·5603	36·8396	34·9598	38·7739	73	9·6458	7·7735	7·4840	8·9903
28	39·8486	36·0796	34·2557	38·0520	74	9·2622	7·5311	7·0759	8·6245
29	39·1308	35·3251	33·5569	37·3289	75	8·8893	7·2944	6·6761	8·2670
30	38·4073	34·5753	32·8603	36·6051	76	8·5218	7·0463	6·2840	7·9114
31	37·6787	33·8294	32·1632	35·8803	77	8·1548	6·7694	5·8977	7·5512
32	36·9448	33·0866	31·4698	35·1549	78	7·7962	6·4688	5·5216	7·1926
33	36·3078	32·3460	30·7815	34·4288	79	7·4530	6·1493	5·1596	6·8411
34	35·4654	31·6062	30·0995	33·7018	80	7·1317	5·8152	4·8143	6·5016
35	34·7211	30·8663	29·4251	32·9742	81	6·8395	5·4693	4·4877	6·1807
36	33·9748	30·1259	28·7590	32·2460	82	6·5804	5·1139	4·1778	5·8796
37	33·2268	29·3832	28·0972	31·5170	83	6·3354	4·7565	3·8911	5·5889
38	32·4771	28·6398	27·4404	30·7877	84	6·0853	4·4033	3·6230	5·2975
39	31·7257	27·8960	26·7900	30·0589	85	5·8105	4·0592	3·3730	4·9937
40	30·9724	27·1530	26·0873	29·3306	86	5·4905	3·7271	3·1401	4·6652
41	30·2173	26·4113	25·5109	28·6037	87	5·1082	3·4063	2·9226	4·2997
42	29·4598	25·6716	24·8841	27·8786	88	4·6845	3·1069	2·7219	3·9193
43	28·7018	24·9353	24·2634	27·1555	89	4·2447	2·8330	2·5378	3·5424
44	27·9440	24·2041	23·6460	26·4351	90	3·8091	2·5861	2·3724	3·1839
45	27·1880	23·4264	23·0299	25·7177	91	3·3844	2·3743	2·2263	2·8549
46	26·4340	22·7613	22·4125	25·0034	92	2·9879	2·2080	2·1059	2·5663
47	25·6837	22·0523	21·7913	24·2923	93	2·6169	2·0729	2·0013	2·3153
48	24·5489	21·3515	21·1687	23·5860	94	2·2665	1·9502	1·9034	2·0864
49	24·2000	20·6123	20·5466	22·8856	95	1·9394	1·8184	1·8028	1·8694
50	23·4700	19·9733	19·9271	22·1920	96	1·6446	1·6675	1·6765	1·6517
51	22·7485	19·2955	19·3113	21·5060	97	1·3795	1·4734	1·4607	1·4077
52	22·0379	18·6242	18·7011	20·8282	98	1·0668	1·2187	1·1896	1·1542
53	21·3371	17·9629	18·0933	20·1591	99	·8476	·9772	·9285	·8861
54	20·6484	17·3144	17·4464	19·4983	100	·5000	·5000	·5000	·5000
55	19·9623	16·6810	16·8753	18·8455					

Age.	EXPECTATION.		Difference in favour of			
			Town Districts.		England and Wales.	
	Town Districts.	England and Wales.	In Years.	Per Cent.	In Years.	Per Cent.
20	42·2742	40·6910	1·5832	3·888	.....	.....
30	34·5743	34·0990	0·4763	1·397	.....	.....
40	27·1530	27·4760	.....	.....	0·3230	1·176
50	19·9733	20·8463	.....	.....	0·8730	4·188
60	13·7608	14·5854	.....	.....	0·8246	5·653
70	8·7030	9·2176	.....	.....	0·5146	5·582

The Expectation of Life in the City Districts will be found to be less than in Table D, from age 12 upwards. At 20 the difference is ·68 years, at 40 it is 1·39 years, and at 60 the difference is ·82 years in favour of the general value of Male Life in Table D. The following gives a comparative view of both Tables:—

Age.	EXPECTATION.		Difference in favour of England and Wales.	
	City Districts.	England and Wales.	In Years.	Per Cent.
20	40·0148	40·6910	0·6762	1·664
30	32·8603	34·0990	1·2387	3·632
40	26·0873	27·4760	1·3887	5·054
50	19·9271	20·8463	0·9192	4·409
60	13·7685	14·5854	0·8169	5·608
70	8·7636	9·2176	0·4550	4·092

The comparative value of life in the three districts at decennial periods will be seen by an inspection of the following Table; the 6th and 8th columns of which will point out the gradual decrease in the value of Life in moving from the Rural to the Town, and from the Town to the City Districts:—

Age.	EXPECTATION OF LIFE.			Excess in favour of Rural, over			
				Town Districts.		City Districts.	
	Rural.	Town.	City.	In Years.	Per Cent.	In Years.	Per Cent.
20	45·3550	42·2742	40·0148	3·0808	6·790	5·3402	11·774
30	38·4073	34·5753	32·8603	3·8320	9·977	5·5470	14·442
40	30·9724	27·1530	26·0873	3·8194	12·331	4·8851	15·772
50	23·4700	19·9733	19·9271	3·4967	14·900	3·5429	15·100
60	16·6524	13·7608	13·7685	2·8916	17·364	2·8837	17·318
70	10·7124	8·7030	8·7636	2·2094	20·246	2·1488	19·691
Total Excess.....				19·3299.....		24·3479	

The next arrangement of this kind which will be brought under notice is the Expectation of Life as derived from the combination of all the data composing the three Districts now referred to; and may be understood to represent the general value of Male Life as it exists among the Members of the Community composing Friendly

Societies. Throughout the whole range of this Table the Expectation of Life is found to be higher than among the male population of the country generally. A glance at the following abridgment of Table G, for the three Districts, will shew the difference at the given periods of life:—

Age.	EXPECTATION IN		Difference in favour of the Three Districts.	
	Three Districts.	England and Wales.	In Years.	Per Cent.
20	43·7736	40·6910	3·0826	7·575
30	36·6051	34·0990	2·5061	7·349
40	29·3306	27·4760	1·8546	6·750
50	22·1920	20·8463	1·3457	6·455
60	15·6942	14·5854	1·1088	7·602
70	10·2057	9·2176	0·9881	10·720

A very important distinction is here found to prevail between the value of life in the two Tables. The circumstances in which the humble and working population of the country is placed, have generally been thought adverse to a prolonged duration of life; but the healthiest Life Tables hitherto formed have not shewn any thing so favourable as the present results, even among what are generally considered the select classes of Society:—

It may be well to be understood here, that the persons composing Friendly Societies are almost exclusively the hard-working members of the community, chiefly occupied in the drudgeries and toils of the mechanical arts, and consequently exposed to the inclemencies of seasons, excesses of temperature, impure atmospheres, constrained postures, and other conditions usually thought objectionable. Their incomes are very limited, affording but the scantiest and simplest means of support. Their habitations are of an inferior order, being of the cheapest kind, and consequently in the worst streets. The Members of Friendly Societies are therefore generally placed in those circumstances which persons habituated to the luxuries of the upper ranks of society would regard as unfavourable to health and a superior duration of life. In making these remarks, however, it is necessary, as will hereafter be seen, to make a distinction between them, and the great bulk of the poorer classes of the country. For an individual to remain a Member of a Friendly Society, it is required that he should make his weekly or monthly contribution to its funds; and although a few pence is all that is needed, it presumes on a certain amount of frugality and industrial habit, sufficient to separate him from the reckless and improvident, who are more openly exposed to the vicissitudes—poverty, distress, destitution and disease—incidental to fluctuations in the demand for labour.

The superior value of life among the Members of Friendly Societies is a very remarkable and important feature in this inquiry, and is a result that generally would not have

been anticipated; and the question which naturally follows is, From what source or class does the excess of mortality, which makes up the general average of the community, arise?

Those persons having transactions with the Assurance Companies belong, with a very few exceptions, either to the middle or the higher ranks of society; and if the value of life, as deduced from observations in those Companies, be admitted as a correct measure for such classes, it will be found that their duration of life is not only less than among the Members of Friendly Societies, but also less than in the country generally.

In Table H. No. 5, col. 2nd, the Expectation of Life is given as deduced from the aggregate observations of Assurance Companies, and includes both sexes; but col. 1st (Males d 1) of the same Table relates to Male Lives only, and is consequently that which should be brought into comparison with the results of this inquiry.

It may be said, in reply to some of the preceding observations, that the superior value of life in the ranks of Friendly Societies, above the general community, is owing to the effects of selection; but a little reflection will shew that the difference must be produced by other causes. Every reasonable means is adopted to test the lives admitted into Assurance Companies, and yet they appear to be of less value than the general average of the country; and Friendly Societies are known *not* to exercise the same degree of scrutiny. In both, the interest of the applicant for admission is opposed to that of the Society; and, looking at the results, it is not unlikely that the vigilance of the one may be neutralised by the interests of the other. Another result brought out by the observations on the lives in Assurance Offices will shew how inadequate the means of selection usually resorted to are to raise the standard of life above the average of the country. All other inquiries hitherto made on Male and Female Life have tended to attach a greater value to the latter than to the former; but the results in the Assurance Companies have been reversed, shewing that some other causes, beyond the method of selection, must have interfered to modify the state of health; for if the means of scrutiny had been adequate to determine the actual character and condition of health, the prevailing feature of each sex would have manifested itself, and the anomalous results of Male Life being of higher absolute value than Female Life not appeared.

Assurance Companies, it has been stated, are likely to have proposals most freely from among unhealthy persons for sums payable at death; but that proposals for annuities, or sums payable during life, will be made on the lives of the most healthy only; and that the private opinion of the individual being always brought to bear against the Company, the effects of selection under this aspect ought to prevent the results of such observations from being regarded as a true exponent of the value of life in the class of society generally to which those persons belong. There exists no published document, so far as Assurance Offices are concerned, to shew whether this opinion is well founded: but there is evidence of the same kind—of equal, or perhaps, from its

[greater

Table H.

Expectation of Life.

Age.	No. 1. Friendly Societies. Females. Rural, Town, & City.	No. 2. Friendly Societies. Males. Liverpool.	No. 3. Peerage.	Age.	No. 1. Friendly Societies. Females. Rural, Town, & City.	No. 2. Friendly Societies. Males. Liverpool.	No. 3. Peerage.
10	49·4925	46·0009	... ...	56	19·9582	14·0881	14·6308
11	49·1826	45·1818	... ...	57	19·2966	13·5449	14·0970
12	48·8685	44·3597	... ...	58	18·6222	12·9960	13·5737
13	48·5413	43·5377	... ...	59	17·9358	12·4621	13·0637
14	48·1921	42·7188	... ...	60	17·2380	11·9626	12·5671
15	47·8130	41·9006	... ...	61	16·5294	11·5151	12·1091
16	47·3949	41·1034	... ...	62	15·8112	11·1372	11·6080
17	46·9305	40·3122	... ...	63	15·0965	10·8[illegible]97	11·1420
18	46·4196	39·5276	... ...	64	14·3974	10·5137	10·6830
19	45·8639	38·7437	... ...	65	13·7245	10·2321	10·2303
20	45·2640	37·9553	38·4750	66	13·0869	9·9467	9·7857
21	44·6198	37·1574	37·6614	67	12·4924	9·6407	9·3518
22	43·9342	36·3453	36·9640	68	11·9420	9·3156	8·9325
23	43·2191	35·5277	36·1016	69	11·4333	8·9733	8·5321
24	42·4872	34·7124	35·3445	70	10·9750	8·6156	8·1506
25	41·7504	33·9067	34·5967	71	10·5603	8·2435	7·7873
26	41·0194	33·1189	33·8543	72	10·1940	7·8582	7·4405
27	40·3056	32·3541	33·1200	73	9·8569	7·4648	7·1102
28	39·6003	31·6069	32·3912	74	9·5314	7·0681	6·7941
29	38·8956	30·8719	31·6535	75	9·2001	6·6720	6·4866
30	38·1841	30·1437	30·8760	76	8·8460	6·2793	6·1883
31	37·4589	29·4175	30·2306	77	8·4525	5·8923	5·8996
32	36·7129	28·6887	29·5153	78	8·0339	5·5159	5·6204
33	35·9540	27·9612	28·8023	79	7·6031	5·1531	5·3506
34	35·1899	27·4392	28·0900	80	7·1725	4·8067	5·0884
35	34·4280	26·5260	27·3790	81	6·7518	4·4792	4·8389
36	33·6748	25·8251	26·6700	82	6·3502	4·1715	4·6016
37	32·9367	25·1392	25·9690	83	5·9622	3·8835	4·3799
38	32·2103	24·4666	25·1590	84	5·5817	3·6138	4·1770
39	31·4929	23·8050	24·5830	85	5·2026	3·3621	3·9958
40	30·7813	23·1524	24·4500	86	4·8192	3·1255	3·8400
41	30·0735	22·5069	23·2420	87	4·4232	2·9042	3·7117
42	29·3664	21·8666	22·5921	88	4·0015	2·6978	3·6076
43	28·6606	21·2331	21·9635	89	3·5969	2·5047	3·5084
44	27·9567	20·6073	21·3520	90	3·2186	2·3524	3·4044
45	27·2551	19·9908	20·9494	91	2·8732	2·1971	3·2729
46	26·5564	19·3839	20·1742	92	2·5662	2·0602	3·1161
47	25·8611	18·6879	19·6039	93	2·3144	1·9423	2·8989
48	25·1717	18·2059	19·0404	94	2·0862	1·8292	2·6338
49	24·4905	17·6405	18·4803	95	1·8684	1·7062	2·3720
50	23·8200	17·0946	17·9221	96	1·6495	1·5526	2·1159
51	23·1610	16·5705	17·7590	97	1·4043	1·3750	1·8689
52	22·5164	16·0706	16·8121	98	1·1506	1·1469	1·6363
53	21·8795	15·5834	16·2270	99	·8869	·8750	1·4231
54	21·2445	15·0975	15·7137	100	·5000	·5000	1·2142
55	20·6060	14·6024	15·1722				

Table H.—(*continued.*)

Expectation of Life.

Age.	No. 4. Friendly Societies. 16 Trades. Rural Districts. Males.	No. 5. Life Assurance Offices.		No. 6. Government. Males.	Age.	No. 4. Friendly Societies. 16 Trades. Rural Districts. Males.	No. 5. Life Assurance Offices.		No. 6. Government. Males.
		Males *d* 1	Aggregate.				Males *d* 1	Aggregate.	
10	52·0363	...	...	44·2721	56	18·8093	15·66	16·23	15·7971
11	51·1551	...	...	43·5540	57	18·1542	15·09	15·62	15·2060
12	50·3863	...	...	42·8244	58	17·5052	14·45	14·98	14·6188
13	49·3939	...	...	42·0745	59	16·8639	13·99	14·38	14·0444
14	48·5297	...	...	41·3130	60	16·2322	13·47	13·81	13·4830
15	47·6860	...	...	40·5612	61	15·6110	12·09	13·24	12·9379
16	46·8692	...	...	39·8399	62	15·0020	12·46	12·68	12·4099
17	46·0858	...	...	39·1568	63	14·4084	11·90	12·09	11·8913
18	45·3321	...	...	38·5202	64	13·8333	11·27	11·50	11·3770
19	44·6041	...	...	37·9383	65	13·2795	10·87	11·03	10·8672
20	43·8978	39·84	40·97	37·4079	66	12·7495	10·38	10·51	10·3682
21	43·2102	39·29	40·45	36·9217	67	12·2454	9·93	10·03	9·8927
22	42·5377	38·70	39·92	36·4565	68	11·7598	9·33	9·46	9·4497
23	41·8756	37·98	39·18	36·0047	69	11·2856	8·81	8·99	9·0381
24	41·2197	37·41	38·54	35·5502	70	10·8160	8·34	8·50	8·6547
25	40·5657	36·63	37·84	35·0806	71	10·3441	7·88	8·13	8·2894
26	39·9096	35·88	37·13	34·5912	72	9·8643	7·43	7·72	7·9333
27	39·2472	35·23	36·42	34·0772	73	9·3862	6·97	7·26	7·5716
28	38·5785	34·63	35·76	33·5421	74	8·9188	6·57	6·84	7·1992
29	37·9028	33·96	35·06	32·9896	75	8·4698	6·03	6·46	6·8215
30	37·2237	33·17	34·25	32·4192	76	8·0465	5·63	6·08	6·4411
31	36·5380	32·44	33·50	31·8346	77	7·6552	5·48	5·77	6·0660
32	35·8464	31·73	32·75	31·2315	78	7·2976	5·16	5·37	5·7074
33	35·1492	30·92	31·98	30·6097	79	6·9750	4·99	5·07	5·3810
34	34·4464	30·21	31·27	29·9689	80	6·6900	4·75	4·75	5·0857
35	33·7378	29·52	30·55	29·3167	81	6·4455	...	...	4·8093
36	33·0235	28·87	29·90	28·6648	82	6·2459	...	...	4·5293
37	32·3035	28·15	29·20	28·0170	83	6·0681	...	...	4·2540
38	31·5766	27·49	28·51	27·3846	84	5·8879	...	...	3·9906
39	30·8416	26·81	27·79	26·7676	85	5·6791	...	...	3·7427
40	30·0976	26·06	27·07	26·1511	86	5·4152	...	...	3·5156
41	29·3439	25·42	26·41	25·5311	87	5·0692	...	...	3·3039
42	28·5795	24·70	25·68	24·9037	88	4·6659	...	...	3·1203
43	27·8121	24·00	24·98	24·2616	89	4·2354	...	...	2·9693
44	27·0490	23·34	24·26	23·6006	90	3·8023	...	...	2·8233
45	26·2370	22·63	23·55	22·9172	91	3·3764	...	...	2·6531
46	25·5610	21·98	22·85	22·2182	92	2·9791	...	...	2·4718
47	24·8486	21·24	22·12	21·5103	93	2·6054	...	...	2·3000
48	24·1539	20·62	21·41	20·8035	94	2·2512	...	...	2·0714
49	23·4722	20·08	20·79	20·1108	95	1·9194	...	...	1·7917
50	22·7993	19·41	20·11	19·4414	96	1·6126	...	...	1·4375
51	22·1305	18·73	19·46	18·7984	97	1·3285	...	...	1·0000
52	21·4622	18·05	18·79	18·1784	98	1·0655	...	...	·5000
53	20·7949	17·40	18·16	17·5754	99	·8415	...	...	...
54	20·1302	16·77	17·50	16·9800	100	·5000	...	...	...
55	19·4680	16·21	16·83	16·3893					

greater extent, of higher value than any to be drawn from the Assurance Companies; it happens, however, that assured lives are of greater instead of less value than those of annuitants. The tables calculated by Mr. Finlaison, on the lives among the nominees of the Government Tontines and Annuity schemes, are here alluded to. The facts over which his observations extended possessed almost every advantage that could be desired; and, considering the acknowledged skill and care with which his computations were managed, the Government Table must be entitled to the highest confidence, and the Expectation of Life thence deduced regarded as the true measure of life in that particular class of society.

Table H, No. 6, has been recalculated for the present paper from the facts given by Mr. Finlaison at page 67 of his Report on Life Annuities in March 1829—being the combined results of six different classes of observations on male lives. That usually quoted as the Expectation Table of the Government Annuitants, is the one calculated by Mr. Finlaison in 1825, and differs in some important particulars from his subsequent and revised data in 1829. This table, then, will shew that the male lives selected for the Government Annuities are not only of less duration than the male population of the country generally, and are also of less value than lives in Assurance Companies, but are actually shorter lived than the members of Friendly Societies in the City Districts. It is evident from those results, that the presumed power of the individual to judge of his own state of health has not shewn the remarkable effects anticipated: there is more reason to believe that the natural inclination with which every person is led to look upon his life as good, will very much influence any power of discrimination on his own chances of longevity. It is, however, to be kept in view, that persons of decidedly bad health will rarely purchase annuities; and the exclusion of these has, no doubt, some effect in slightly raising the standard of the table. A similar observation is also to be made with respect to the applicants to Assurance Companies. There is a strong temptation for those in really bad, or at least in indifferent health, to offer themselves for assurance; and if all were admitted, no doubt a lower value would be expressed by the results in Table H, No. 5. The known caution, however, usually exercised in these matters, and the medical talent brought to the aid of the Offices, is a protection against the very worst lives of that class; about 23 per cent. of the applicants being the average number rejected.

Friendly Societies, although not equally solicitous, are still not without tests for the admission of Members, and they possess one advantage over Assurance Companies; the Members, and those likely to be candidates, are generally intimately known in their daily habits and ordinary health to each other; and where evidently bad health exists, admission is refused. A consideration of all that has been advanced will shew that the greater vitality among Members of Friendly Societies cannot be accounted for by the superior mode in the selection of lives; for, if that argument were carried out to its full extent,

it would go to prove that the other classes in question had, in that respect, the advantage. The blessing thus bestowed on the frugal and industrious workmen of the country composing Friendly Societies, in having granted them, as appears by the present inquiry, a prolonged duration of life, must therefore be regarded as a really true and distinctive feature of that class of persons, and is, no doubt, the result of their simple and uniform habits of life, and the more regular and natural physical exercises to which they are habituated.

If the nature of the present paper led to a further investigation of this point, it could be clearly shewn, by tracing the various classes of society in which there exists sufficient means of subsistence, beginning with the most humble, and passing on to the middle and upper classes, that a gradual deterioration in the duration of life takes place; and that just as life, with all its wealth, pomp, and magnificence, would seem to become more valuable and tempting, so are its opportunities and chances of enjoyment lessened. As far as the results of figures admit of judging, this condition would seem to flow directly from the luxurious and pampered style of living among the wealthier classes, whose artificial habits interfere with the nature and degree of those physical exercises which, in a simpler class of society, are accompanied with a long life.

Thus far, then, it is plain that the amount of life enjoyed by the middle and upper classes tends rather to depreciate than elevate the standard deduced from the general results of the country. And carrying this out still further, and viewing the value of life in the highest ranks of society—namely, the peerage and baronetage—as given in the recent and very interesting paper submitted by Dr. Guy, it will be seen that the Expectation of Life is not only less than in the general community, but also very much below the measure of life *among the Members of Friendly Societies in the* City Districts. The Expectation of Life in the peerage will be found in Table H, No. 3. It may then be conclusively admitted, that the standard of life in the general community is not elevated in any way by the influence of the middle or upper classes. With regard to the very highest ranks, the opposite conclusion must be come to; but as the numbers of the nobility are relatively small, the inferior value of life there shewn is not sufficient to account for the reduction of the scale for the general community so much below the average standard of all classes in Friendly Societies.

It hence follows that the excess of mortality in the general community must fall on the residue of the people; and although at present there exists no direct means of measuring the precise value of life in that portion of the population, it is evident that an inferential one of equal importance is immediately available.

Admitting that the preceding Tables form a correct representation of the value of life in the respective classes, it will be easy to arrive at the value of life in the remaining class; for—

Let Table A represent the rate of mortality in the general community—viz. over all England and Wales;

And let b = rate of mortality in one class—viz. Friendly Societies—and forming a part of A or included in it;—Also

Let c = rate of mortality in a second class—viz: the middle and upper classes, and also included in A;—then it is evident that

$A-(b+c)$ = the rate of mortality in the remaining class, composing the Community. And this latter class includes the improvident and reckless, the poor and the destitute, who are exposed to the inclemencies of the seasons, the fluctuations of trade, and fall victims to epidemical and other diseases. Subsequent illustrations will more clearly establish this fact, when the question of large towns or cities is brought under consideration.

In making the preceding comparisons of the mortality of the Rural, Town, and City Districts respectively, with the average results for the whole population of England and Wales, no further corrections of the figures than those described were needed; but before bringing the table representing the combined results of the three districts into comparison with the mortality of the whole population of the country, it would have been important to be enabled to apply a further correction to the elementary data.

An inspection of the arrangement of the data presented in Table E will shew, that if

R, T, and C, represent the population over which the observations in that Table extend, for the Rural, Town, and City Districts respectively and

r, t, and c represent the number of deaths in the same population for the respective districts at each period of life;

then the mortality per cent., and consequently all subsequent results for the average of the three districts, or rather the three districts combined, as set forth in Table E, is derived from—

$$\frac{(r+t+c)\cdot 100}{R+T+C}$$

This is the usual mode by which general averages for various classes of lives have been hitherto determined; but it is evident that unless R, T, and C, bear the same ratio to each other which the whole population of the districts they represent do to each other, the average results cannot be true.

This fact may be rendered more intelligible by the following hypothetical illustration. Suppose at any given age the population over which the actual observations extend was 100 for each of the three districts, viz:—

For District	R = 100	Annual Deaths	2
...	T = 100	...	3
...	C = 100	...	4
	R + T + C = 300	...	9

then the average result thus derived would shew a mortality of 3 per cent.; but if the whole population of those districts had been to each other in any other relation than an equality of numbers—say 100, 50, and 25—then the number of deaths would have become 2, 1·5, and 1, respectively: consequently, the correct average mortality would have been 2·571 per cent. instead of 3 per cent.

The following mode of obtaining a correct average has also been suggested, but it is obvious that it would involve errors of a more serious nature than the common method employed.

$$\frac{\frac{r \cdot 100}{R} + \frac{t \cdot 100}{T} + \frac{c \cdot 100}{C}}{3}$$

A single illustration will be adequate to point out the fallacies of this.

At age 40—45 the actual mortality of the Rural District is ·8361 per cent:

...	...	Town Districts	1·0637	...
...	...	City Districts	1·6084	...
		Average for the three	1·1694	

But supposing the actual population of the whole of each district at that age was in the ratio of 82763, 34220 and 25428, which are the actual numbers in Table E at this term of life, then the correct average mortality of the whole kingdom would be 1·0287 per cent. but the above result was ... ... 1·1694

Difference 0·1407 or an error on the amount of the true result of 13·7766 per cent.

Although Table E, for all the Districts combined, is a correct measure of the average mortality of Friendly Societies in England and Wales, being composed of the actual numbers in those Districts, and in this respect perfect for the purposes of Friendly Societies; yet, unless the numbers representing, at particular years of age, each of the three Districts in Table E, bear the same ratio to the combined Districts of that Table, at the same ages which the actual population of the country in each of these Districts has to the whole population of the country at those ages, corrections would be required for purposes of comparison with the general mortality of the kingdom. But for the same reasons that the corrections suggested would improve the Table for comparison with the general mortality of the country, would they also injure the results for the purpose of Friendly Societies. It would, therefore, be better to have the facts under both forms.

As stated in the early part of this paper, if the districts of the Census Commissioners and Registrar-General had been coincident or coterminous, the labour of determining the population at each term of life for the three corresponding Districts would have been well repaid.

As already stated, these observations do not in any way affect the Rates of Mortality as represented in any one District, but affect the combined results for the three Districts only. So far as any individual District is concerned, or the comparison of one District with another, or with the general mortality for the whole kingdom, those objections do not apply, for in respect of locality simple elements only enter into the data of each district.

To some it may appear that too much importance has been given to the nature of this error; but as it so constantly enters, under some aspect or other, into nearly all inquiries into Vital Statistics, frequently producing errors of considerable magnitude, it has been deemed necessary to allude to it at length.

The distinction between the Rates of Mortality in the three Districts has been already pointed out; and so far as a single expression of the value of life among those classes, in given Districts, is required, nothing more is needed; and the difference between the tables will shew the relative value of life in the given Districts. Hitherto it has been thought sufficient to rest at this stage in all inquiries into the influence of locality on the Duration of Life, and to assign the difference thus appearing in the value of life between the respective Districts to the peculiar influence of Town or City Life. Other causes than locality will, however, be shewn to influence the Duration of Life.

If the data composing the facts presented in the preceding Tables be analysed, so as to distinguish one employment from another, it will be found that some occupations are much more healthy than others. The first evidence of this to be brought forward will be confined to the Rural Districts. An inspection of TABLE I, which represents the Mortality of Labourers in the Rural Districts, chiefly agricultural labourers, will shew a much higher specific intensity to the age of 80 than the general results for all employments in the Rural Districts; the specific intensity of Labourers, however, decreases in a gradual and regular series from the youngest ages in the Table, following the rule of the general results of the other Districts, and not presenting the apparent anomaly of the general results for the Rural Districts by shewing an increasing specific intensity from twenty to thirty-one years of age. It will be found that the specific intensity of the General Results for the Rural Districts—

At Age	20	in TABLE F, is as high as age	41	for Labourers in TABLE I;
...	30	...	41	...
...	40	...	44	...
...	50	...	54	...
...	60	...	64	...
...	70	...	72	...

[The Population

Table I, No. 1.

Rural Districts.—Labourers.—*Males.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	230	·2300	434·783	56	73583	1043	1·4174	70·572
11	99770	229	·2300	434·783	57	72540	1081	1·4904	67·114
12	99541	243	·2438	410·172	58	71459	1110	1·5535	64·350
13	99298	270	·2715	368·324	59	70349	1130	1·6067	62·228
14	99028	310	·3130	319·489	60	69219	1142	1·6501	60·606
15	98718	364	·3684	271·444	61	68077	1146	1·6835	59·382
16	98354	430	·4377	228·467	62	66931	1192	1·7801	56·180
17	97924	486	·4965	201·410	63	65739	1275	1·9399	51·546
18	97438	531	·5448	183·554	64	64464	1394	2·1628	46·232
19	96907	565	·5827	171·615	65	63070	1545	2·4489	40·833
20	96342	588	·6102	163·881	66	61525	1722	2·7981	35·740
21	95754	601	·6273	159·413	67	59803	1894	3·1676	31·566
22	95153	605	·6363	157·159	68	57909	2060	3·5573	28·114
23	94548	602	·6372	156·937	69	55849	2216	3·9673	25·208
24	93946	592	·6302	158·680	70	53633	2359	4·3975	22·738
25	93354	574	·6151	162·575	71	51274	2486	4·8480	20·627
26	92780	549	·5919	168·948	72	48788	2563	5·2532	19·037
27	92231	530	·5746	174·034	73	46225	2595	5·6130	17·816
28	91701	516	·5632	177·557	74	43630	2586	5·9276	16·869
29	91185	508	·5576	179·340	75	41044	2543	6·1967	16·137
30	90677	506	·5578	179·276	76	38501	2472	6·4205	15·574
31	90171	508	·5638	177·368	77	36029	2472	6·8614	14·575
32	89663	511	·5699	175·469	78	33557	2523	7·5194	13·300
33	89152	514	·5761	173·581	79	31034	2605	8·3945	11·912
34	88638	516	·5824	171·703	80	28429	2698	9·4887	10·539
35	88122	519	·5887	169·866	81	25731	2778	10·7980	9·259
36	87603	521	·5950	168·067	82	22953	2691	11·7226	8·532
37	87082	529	·6076	164·582	83	20262	2485	12·2626	8·157
38	86553	542	·6265	159·617	84	17777	2208	12·4180	8·051
39	86011	560	·6515	153·492	85	15569	1897	12·1867	8·203
40	85451	583	·6828	146·456	86	13672	1582	11·5728	8 643
41	84868	596	·7203	138·831	87	12090	1384	11·4485	8·734
42	84272	634	·7522	132·943	88	10706	1282	11·9761	8·347
43	83638	651	·7785	128·452	89	9424	1240	13·1556	7·599
44	82987	663	·7992	125·125	90	8184	1212	14·8092	6·752
45	82324	670	·8143	122·805	91	6972	1207	17·3142	5·777
46	81654	673	·8238	121·389	92	5765	1163	20·1724	4·958
47	80981	684	·8445	118·413	93	4602	1080	23·4758	4·259
48	80297	704	·8762	114·129	94	3522	973	27·6246	3·620
49	79593	732	·9191	108·802	95	2549	837	32·8260	3·046
50	78861	767	·9732	102·754	96	1712	670	39·1324	2·556
51	78094	811	1·0383	96·339	97	1042	490	47·0458	2·125
52	77283	856	1·1070	90·334	98	552	319	57·7774	1·731
53	76427	901	1·1793	84·818	99	233	154	66·0370	1·514
54	75526	948	1·2551	79·681	100	79	79	85·0000	1·176
55	74578	995	1·3345	74·906					

Table I, No. 2.

Rural, Town, and City Districts.—Clerks.—*Males.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	396	·3961	252·462	56	42118	2422	5·7089	17·516
11	99604	395	·3961	252·462	57	39996	2506	6·2646	15·962
12	99209	401	·4038	247·647	58	37490	2464	6·5720	15·216
13	98808	414	·4193	238·493	59	35026	2323	6·6310	15·081
14	98394	435	·4425	225·989	60	32703	2107	6·4416	15·523
15	97959	464	·4735	211·193	61	30596	1837	6·0038	16·656
16	97495	499	·5123	195·198	62	28759	1631	5·6694	17·640
17	96996	576	·5937	168·435	63	27128	1475	5·4385	18·386
18	96420	692	·7180	139·276	64	25653	1362	5·3110	18·829
19	95728	847	·8849	113·007	65	24291	1284	5·2870	18·914
20	94881	1039	1·0946	91·324	66	23007	1235	5·3665	18·632
21	93842	1264	1·3470	74·239	67	21772	1201	5·5167	18·126
22	92578	1464	1·5813	63·251	68	20571	1180	5·7377	17·428
23	91114	1638	1·7973	55·648	69	19391	1169	6·0295	16·584
24	89476	1785	1·9952	50·125	70	18222	1153	6·3291	15·645
25	87691	1907	2·1749	45·977	71	17069	1165	6·8255	14·650
26	85784	2004	2·3365	42·790	72	15904	1161	7·2988	13·701
27	83780	2026	2·4184	41·356	73	14743	1152	7·8120	12·801
28	81754	1979	2·4208	41·305	74	13591	1137	8·3651	11·955
29	79775	1870	2·3436	42·662	75	12451	1116	8·9582	11·163
30	77905	1704	2·1868	45·725	76	11338	1088	9·5911	10·426
31	76201	1486	1·9505	51·256	77	10250	1062	10·3620	9·653
32	74715	1317	1·7629	56·722	78	9188	1036	11·2708	8·873
33	73398	1192	1·6240	61·576	79	8152	1004	12·3175	8·117
34	72206	1108	1·5340	65·189	80	7148	965	13·5021	7·407
35	71098	1061	1·4927	66 979	81	6183	917	14·8247	6·748
36	70037	1051	1·5002	66·667	82	5266	855	16·2430	6·158
37	68986	1065	1·5431	64·809	83	4411	783	17·7573	5·631
38	67921	1101	1·6215	61·652	84	3628	703	19·3673	5·162
39	66820	1160	1·7354	57·637	85	2925	616	21·0732	4·746
40	65660	1238	1·8847	53·050	86	2309	528	22·8750	4·371
41	64422	1333	2·0694	48·333	87	1781	442	24·8032	4·032
42	63089	1388	2·1997	45·455	88	1339	360	26·8580	3·723
43	61701	1404	2·2754	43·956	89	979	284	29·0393	3·444
44	60297	1385	2·2967	43·535	90	695	218	31·3471	3·190
45	58912	1333	2·2634	44·189	91	477	161	33·7814	2·960
46	57579	1253	2·1756	45·956	92	316	114	36·0243	2·776
47	56326	1215	2·1572	46·361	93	202	77	38·0758	2·626
48	55111	1217	2·2083	45·290	94	125	50	39·9359	2·504
49	53894	1255	2·3287	42·937	95	75	31	41·6047	2·404
50	52639	1326	2·5186	39·698	96	44	19	43·0820	2·321
51	51313	1426	2 7780	35·997	97	25	12	47·3179	2·113
52	49837	1570	3·1462	31·786	98	13	7	53·9970	1·852
53	48317	1751	3·6235	27·594	99	6	4	61·3067	1·631
54	46566	1960	4·2097	23·753	100	2	2	75·0000	1·333
55	44606	2188	4·9048	20·387					

Table I, No. 3.

Rural, Town, and City Districts.—Plumbers, Painters, &c.—*Males.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	350	·3499	285·796	56	51301	1952	3·8051	26·281
11	99650	349	·3499	285·796	57	49349	1933	3·9167	25·530
12	99301	416	·4192	238·550	58	47416	1956	4·1240	24·248
13	98885	552	·5579	179·244	59	45460	2021	4·4467	22·487
14	98333	753	·7659	130·565	60	43439	2131	4·9050	20·387
15	97580	1018	1·0432	95·877	61	41308	2263	5·4789	18·252
16	96562	1342	1·3899	71·942	62	39045	2345	6·0046	16·653
17	95220	1538	1·6148	61·920	63	36700	2386	6·5022	15·380
18	93682	1609	1·7179	58·207	64	34314	2385	6·9518	14·384
19	92073	1565	1·6993	58·858	65	31929	2341	7·3332	13·637
20	90508	1411	1·5588	64·144	66	29588	2268	7·6666	13·043
21	89097	1155	1·2966	77·101	67	27320	2154	7·8836	12·684
22	87942	961	1·0932	91·491	68	25166	2009	7·9844	12·525
23	86981	825	·9485	105·430	69	23157	1845	7·9689	12·549
24	86156	743	·8627	115·915	70	21312	1670	7·8371	12·760
25	85413	714	·8357	119·660	71	19642	1491	7·5890	13·177
26	84699	735	·8674	115·287	72	18151	1352	7·4474	13·428
27	83964	776	·9246	108·155	73	16799	1245	7·4122	13·492
28	83188	838	1·0071	99·305	74	15554	1164	7·4835	13·362
29	82350	918	1·1150	89·686	75	14390	1103	7·6612	13·053
30	81432	1016	1·2482	80·128	76	13287	1061	7·9455	12·585
31	80416	1131	1·4068	71·073	77	12226	1019	8·3358	11·996
32	79285	1195	1·5068	66·357	78	11207	990	8·8322	11·322
33	78090	1209	1·5480	64·599	79	10217	964	9·4347	10·600
34	76881	1177	1·5306	65·317	80	9353	949	10·1433	9·862
35	75704	1101	1·4546	68·729	81	8404	921	10·9580	9·124
36	74603	985	1·3198	75·758	82	7483	872	11·6514	8·584
37	73618	908	1·2335	81·103	83	6611	808	12·2236	8·183
38	72710	869	1·1956	83·612	84	5803	736	12·6744	7·893
39	71841	867	1·2062	82·919	85	5067	659	13·0040	7·692
40	70974	898	1·2651	79·051	86	4408	582	13·2123	7·570
41	70076	962	1·3725	72·833	87	3826	536	14·0171	7·133
42	69114	987	1·4287	69·979	88	3290	507	15·4183	6·485
43	68127	977	1·4336	69·735	89	2783	485	17·4160	5·741
44	67150	932	1·3874	72·098	90	2298	460	20·0101	4·998
45	66218	854	1·2899	77·519	91	1838	426	23·2007	4·310
46	65364	746	1·1412	87·642	92	1412	373	26·4114	3·786
47	64618	737	1·1411	87·642	93	1039	308	29·6421	3·374
48	63881	824	1·2897	77·519	94	731	240	32·8930	3·040
49	63057	1001	1·5870	63·012	95	491	178	36·1639	2·765
50	62056	1262	2·0329	49·188	96	313	124	39·4548	2·535
51	60794	1597	2·6275	38·052	97	189	85	45·1416	2·215
52	59197	1837	3·1024	32·237	98	104	55	52·9088	1·890
53	57360	1983	3·4576	28·918	99	49	30	61·3067	1·631
54	55377	2045	3·6931	27·078	100	19	19	75·0000	1·333
55	53332	2031	3·8089	26·254					

Table I, No. 4.

Rural, Town, and City Districts.—Bakers.—*Males.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	396	·3961	252·462	56	55501	1538	2·7705	36·088
11	99604	395	·3961	252·462	57	53963	1555	2·8822	34·698
12	99209	401	·4038	247·647	58	52408	1560	2·9758	33·602
13	98808	415	·4193	238·493	59	50848	1552	3·0512	32·776
14	98393	435	·4425	225·989	60	49296	1532	3·1085	32 165
15	97958	464	·4735	211·193	61	47764	1503	3·1476	31·766
16	97494	499	·5123	195·198	62	46261	1513	3·2709	30·572
17	96995	521	·5368	186·289	63	44748	1557	3·4783	28·752
18	96474	528	·5472	182·749	64	43191	1628	3·7699	26·525
19	95946	521	·5435	183·993	65	41563	1723	4·1456	24·120
20	95425	501	·5255	190·295	66	39840	1835	4·6055	21·711
21	94924	468	·4934	202·675	67	38005	1923	5·0601	19·763
22	94456	461	·4877	205·044	68	36082	1988	5·5094	18·152
23	93995	478	·5084	196·696	69	34094	2030	5·9534	16·798
24	93517	519	·5555	180·018	70	32064	2050	6·3921	15·645
25	92998	585	·6290	158·983	71	30014	2049	6·8254	14·652
26	92413	674	·7289	137·193	72	27965	2041	7·2987	13·701
27	91739	743	·8103	123·411	73	25924	2025	7·8119	12·801
28	90996	793	·8733	114·508	74	23899	1999	8·3651	11·955
29	90203	828	·9177	108·968	75	21900	1962	8·9581	11·163
30	89375	843	·9437	105·966	76	19938	1912	9·5911	10·426
31	88532	842	·9512	105·130	77	18026	1868	10·3620	9·653
32	87690	815	·9297	107·562	78	16158	1821	11·2708	8·873
33	86875	764	·8791	113·753	79	14337	1766	12·3175	8·117
34	86111	689	·7996	125·063	80	12571	1697	13·5021	7·407
35	85422	590	·6911	144·697	81	10874	1652	14·8247	6 748
36	84832	470	·5535	180·669	82	9282	1508	16·2430	6·158
37	84362	405	·4804	208·160	83	7774	1381	17·7573	5·631
38	83957	396	·4714	212·134	84	6393	1238	19·3673	5·163
39	83561	441	·5272	189·681	85	5155	1086	21·0732	4·746
40	83120	538	·6471	154·536	86	4069	931	22·8750	4·370
41	82582	687	·8314	120·279	87	3138	778	24·8032	4·032
42	81895	903	1·1026	90·662	88	2360	634	26·8580	3·723
43	80992	1183	1·4607	68·446	89	1726	501	29·0393	3·444
44	79809	1518	1·9058	52·466	90	1225	384	31·3471	3·190
45	78291	1909	2·4377	41·017	91	841	284	33·7814	2·960
46	76382	2335	3 0566	32·712	92	557	201	36·0243	2·776
47	74047	2573	3·4752	28·777	93	356	136	38·0758	2·626
48	71474	2640	3·6934	27·078	94	220	87	39·9359	2 504
49	68834	2555	3·7114	26·947	95	133	55	41·6047	2·404
50	66279	2339	3·5290	28·337	96	78	33	43·0820	2·321
51	63940	2012	3 1463	31·786	97	45	21	47·3179	2·113
52	61928	1775	2·8661	34·892	98	24	12	53·9970	1·852
53	60153	1617	2·6884	37·202	99	12	8	61·3067	1·631
54	58536	1530	2·6133	38·270	100	4	4	75·0000	1·333
55	57006	1505	2·6406	37·864					

Table I, No. 5.

Rural, Town, and City Districts.—Miners.—*Males.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	396	·3961	252·462	56	63960	2177	3·4036	29·377
11	99604	395	·3961	252·462	57	61783	2371	3·8368	26·062
12	99209	401	·4038	247·647	58	59412	2558	4·3057	23·223
13	98808	414	·4193	238·493	59	56854	2735	4·8104	20·790
14	98394	435	·4425	225·989	60	54119	2896	5·3509	18·688
15	97959	464	·4735	211·193	61	51223	3036	5·9271	16·872
16	97495	499	·5123	195·198	62	48187	3064	6·3575	15·728
17	96996	540	·5567	179·630	63	45123	2997	6·6422	15·056
18	96456	585	·6070	164·745	64	42126	2857	6·7810	14·747
19	95871	636	·6630	150·830	65	39269	2660	6·7740	14·762
20	95235	690	·7247	137·988	66	36609	2424	6·6213	15·103
21	94545	749	·7922	126·231	67	34185	2241	6·5541	15·258
22	93796	772	·8228	121·536	68	31944	2100	6·5726	15·214
23	93024	759	·8164	122·489	69	29844	1993	6·6767	14·977
24	92265	713	·7731	129·349	70	27851	1912	6·8664	14·564
25	91552	634	·6929	144·321	71	25939	1853	7·1417	14·002
26	90918	524	·5758	173·671	72	24086	1804	7·4885	13·353
27	90394	450	·4976	200·965	73	22282	1762	7·9069	12·647
28	89944	412	·4582	218·245	74	20520	1723	8·3967	11·909
29	89532	410	·4577	218·484	75	18897	1693	8·9582	11·163
30	89122	442	·4960	201·613	76	17204	1650	9·5911	10·426
31	88680	508	·5732	174·459	77	15554	1612	10·3620	9·653
32	88172	552	·6262	159·693	78	13942	1571	11·2708	8·873
33	87620	574	·6549	152·695	79	12371	1524	12·3175	8·117
34	87046	574	·6594	151·653	80	10847	1465	13·5021	7·407
35	86472	553	·6397	156·323	81	9382	1391	14·8247	6·748
36	85919	512	·5957	167·870	82	7991	1298	16·2430	6·158
37	85407	496	·5813	172·028	83	6693	1189	17·7573	5·631
38	84911	506	·5963	167·701	84	5504	1066	19·3673	5·163
39	84405	541	·6408	156·055	85	4438	935	21·0732	4·746
40	83864	599	·7147	139·919	86	3503	801	22·8750	4·371
41	83265	679	·8181	122·234	87	2702	670	24·8032	4·032
42	82586	769	·9308	107·435	88	2032	546	26·8580	3·723
43	81817	861	1·0527	94·967	89	1486	432	29·0393	3·444
44	80956	959	1·1840	84·459	90	1054	330	31·3471	3·190
45	79997	1060	1·3246	75·472	91	724	245	33·7814	2·960
46	78937	1164	1·4744	67·843	92	479	173	36·0243	2·776
47	77773	1254	1·6118	62·035	93	306	117	38·0758	2·626
48	76519	1329	1·7367	57·571	94	189	75	39·9359	2·504
49	75190	1390	1·8491	54·083	95	114	47	41·6047	2·404
50	73800	1438	1·9490	51·308	96	67	29	43·0820	2·321
51	72362	1474	2·0364	49·116	97	38	18	47·3179	2·113
52	70888	1549	2·1858	45·746	98	20	11	53·9970	1·852
53	69339	1588	2·3973	41·719	99	9	6	61·3067	1·631
54	67751	1809	2·6707	37·439	100	3	3	75·0000	1·333
55	65942	1982	3·0061	33·267					

Table I, No. 6.

Residue, by abstracting Labourers from Rural Districts.—*Males.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	230	·2300	434·783	56	65081	1233	1·8948	52·770
11	99770	229	·2300	434·783	57	63848	1276	1·9987	50·025
12	99541	275	·2764	361·795	58	62572	1328	2·1231	47·103
13	99266	367	·3693	270·783	59	61244	1389	2·2681	44·092
14	98899	503	·5085	196·657	60	59855	1456	2·4336	41·085
15	98396	683	·6943	144·030	61	58399	1529	2·6197	38·168
16	97713	905	·9264	107·945	62	56870	1609	2·8309	35·323
17	96808	1051	1·0886	91·827	63	55261	1695	3·0672	32·605
18	95757	1124	1·1747	85·106	64	53566	1783	3·3286	30·039
19	94633	1126	1·1908	83·963	65	51783	1876	3·6151	27·662
20	93507	1061	1·1349	88·106	66	49907	1959	3·9267	25·465
21	92446	932	1·0070	99·305	67	47948	2039	4·2541	23·507
22	91514	830	·9065	110·314	68	45909	2110	4·5972	21·753
23	90684	756	·8335	119·976	69	43799	2170	4·9562	20·178
24	89928	709	·7880	126·904	70	41629	2219	5·3310	18·758
25	89219	687	·7699	129·887	71	39410	2254	5·7215	17·476
26	88532	690	·7793	128·320	72	37156	2269	6·1079	16·372
27	87842	690	·7852	127·356	73	34887	2264	6·4900	15·408
28	87152	687	·7877	126·952	74	32623	2240	6·8680	14·560
29	86465	680	·7867	127·113	75	30383	2200	7·2417	13·808
30	85785	671	·7823	127·828	76	28183	2145	7·6112	13·139
31	85114	659	·7744	129·132	77	26038	2090	8·0283	12·456
32	84455	651	·7713	129·651	78	23948	2033	8·4929	11·774
33	83804	648	·7731	129·349	79	21915	1973	9·0051	11·105
34	83156	648	·7797	128·255	80	19942	1907	9·5649	10·455
35	82508	653	·7912	126·390	81	18035	1830	10·1723	9 833
36	81855	661	·8075	123·839	82	16205	1729	10·6987	9·346
37	81194	666	·8208	121·832	83	14476	1600	11·0564	9·042
38	80528	669	·8312	120·308	84	12876	1445	11·2253	8·905
39	79859	670	·8387	119·232	85	11431	1290	11·2924	8·857
40	79189	668	·8432	118·596	86	10141	1153	11·3768	8·787
41	78521	663	·8447	118·385	87	8988	1049	11·6788	8·562
42	77858	669	·8589	116·428	88	7939	982	12·3700	8·084
43	77189	684	·8858	112·892	89	6957	948	13·6294	7·337
44	76505	708	·9252	108·085	90	6009	928	15·4410	6·477
45	75797	741	·9773	102·323	91	5081	903	17·7744	5·627
46	75056	782	1·0421	95·969	92	4178	864	20·6794	4·836
47	74274	827	1·1128	89·847	93	3314	805	24·2828	4·119
48	73447	874	1·1895	84·034	94	2509	719	28·6464	3·490
49	72573	923	1·2723	78·616	95	1790	609	34·0210	2·939
50	71650	975	1·3610	73·475	96	1181	483	40·8812	2·446
51	70675	1029	1·4565	68·634	97	698	339	48·5636	2·059
52	69646	1078	1·5481	64·599	98	359	212	58·9984	1·695
53	68568	1123	1·6383	61·050	99	147	97	66·0370	1·514
54	67445	1164	1·7261	57·937	100	50	50	85·0000	1·176
55	66281	1200	1·8116	55·188					

The Population in TABLE F was shewn to be bisected at ages 68–9, while among the Labourers that will be seen to take place at ages 71–2. The sum of the series of differences of the points of equal specific intensity between the Rural, Town, and City Districts respectively, and Table C, were shewn to be 55, 23, and 5; but the sum of the same order of differences for Table I is 78; so that the difference between Labourers and the General Results for the Rural Districts is more than equivalent to the mean difference between Towns and Cities and the Rural Districts. It will also be seen that the sum of the series of differences of the points of equal specific intensity in the Rural Districts generally, and the Labourers, is 46, being above the mean of 55 and 23.

The difference for the equation of life to

Age 10, between Rural and Town Districts, is 4 years.
... ... Town and City ... 3 ...
and ... Labourers and Rural ... 3 ...

So that, in this general way of viewing the question, employment produces as wide a distinction as locality.

If TABLE J is now referred to, it will be seen that the Expectation of Life among Labourers in the Rural Districts exceeds the Expectation of the Rural Districts generally throughout the whole term of life. At decennial ages the following is the relative value of life.

Age.	Rural Districts.		Difference in favour of Labourers.		Age.
	General Results. G.	Labourers. J.	In Years.	Per Cent.	
20	45·3550	47·9063	2·5513	5·6251	20
30	38·4073	40·5972	2·1899	5·7017	30
40	30·9724	32·7693	1·7969	5·8016	40
50	23·4700	25·0745	1·6045	6·8500	50
60	16·6524	17·8205	1·1681	7·8146	60
70	10·9124	11·3498	0·4374	4·0072	70

The preceding arrangements, however, do not shew the full influence of employment on health, or rather that of an individual employment on health; for, in making comparisons of classes with any standard, that standard ought not to include the class held in comparison, but be the residue left by abstracting that class from the general results; otherwise the effect of that class, in changing the integral expression, will not be seen to its full extent, and the concealment of the real difference will be the greater in proportion to the

Table J.

Expectation of Life.

Age.	No. 1. Labourers. Rural Districts.	No. 2. Clerks. Rural Districts, Towns & Cities.	No. 3. Plumbers, Painters, &c. Rural Districts, Towns & Cities.	Age.	No. 1. Labourers. Rural Districts.	No. 2. Clerks. Rural Districts, Towns & Cities.	No. 3. Plumbers, Painters, &c. Rural Districts, Towns & Cities.
10	56·0054	39·9856	43·0665	56	20·6469	13·1183	13·9984
11	55·1333	39·1425	42·2160	57	19·8919	12·8824	13·5324
12	54·2590	38·2964	41·3626	58	19·2307	12·7101	13·0637
13	53·3907	37·4498	40·5345	59	18·5262	12·5691	12·6043
14	52·5348	36·6053	39·7593	60	17·8205	12·4264	12·1675
15	51·6982	35·7656	39·0622	61	17·1110	12·2477	11·7694
16	50·8876	34·9334	38·4688	62	16·3955	11·9981	11·4225
17	50·1089	34·1106	38·0039	63	15·6837	11·6894	11·1204
18	49·3563	33·3113	37·6195	64	14·9839	11·3327	10·8590
19	48·6241	32·5485	37·2682	65	14·3041	10·9401	10·6327
20	47·9063	31·8347	36·9040	66	13·6508	10·5228	10·4344
21	47·1974	31·1816	36·4805	67	13·0293	10·0913	10·2591
22	46·4923	30·6005	35·9530	68	12·4392	9·6513	10·0944
23	45·7866	30·0841	35·3447	69	11·8796	9·2082	9·9268
24	45·0768	29·6257	34·6785	70	11·3498	8·7668	9·7429
25	44·3595	29·2186	33·9757	71	10·8489	8·3252	9·5287
26	43·6308	28·8570	33·2580	72	10·3763	7·8984	9·2704
27	42·8876	28·5353	32·5447	73	9·9239	7·4811	8·9762
28	42·1326	28·2300	31·8436	74	9·4844	7·0728	8·6547
29	41·3682	27·9180	31·1625	75	9·0505	6·6729	8·3143
30	40·5972	27·5761	30·5082	76	8·6152	6·3805	7·9630
31	39·8221	27·1815	29·8874	77	8·1720	5·8940	7·6107
32	39·0449	26·7122	29·3066	78	7·7372	5·5175	7·2572
33	38·2658	26·1825	28·7474	79	7·3254	5·1552	6·9268
34	37·4848	25·6065	28·1916	80	6·9510	4·8090	6·5043
35	36·7014	24·9977	27·6222	81	6·6274	4·4816	6·1823
36	35·9159	24·3689	27·0224	82	6·3690	4·1749	5·8817
37	35·1278	23·7326	26·3772	83	6·1485	3·8872	5·5915
38	34·3394	23·0968	25·7004	84	5·9381	3·6182	5·3005
39	33·5527	22·4692	25·0052	85	5·7094	3·3677	4·9977
40	32·7693	21·8573	24·3046	86	5·4321	2·1327	4·6702
41	31·9909	21·2677	23·6096	87	5·0775	2·9133	4·3045
42	31·2136	20·7065	22·9313	88	4·6692	2·7099	3·9243
43	30·4465	20·1611	22·2563	89	4·2364	2·5225	3·5482
44	29·6814	19·6190	21·5728	90	3·8025	2·3490	3·1915
45	28·9164	19·0684	20·8694	91	3·3766	2·1939	2·8651
46	28·1496	18·4982	20·1808	92	2·9789	2·0570	2·5786
47	27·3793	17·8986	19·3622	93	2·6054	1·9356	2·3248
48	26·6083	17·2822	18·5799	94	2·2510	1·8200	2·0937
49	25·8392	16·6612	17·8161	95	1·9194	1·7000	1·8727
50	25·0745	16·0465	17·0955	96	1·6133	1·5455	1·6534
51	24·3158	15·4482	16·4400	97	1·3291	1·3400	1·4101
52	23·5657	14·8755	15·8700	98	1·0652	1·1153	1·1538
53	22·8241	14·3426	15·3622	99	·8390	·8333	·8878
54	22·0904	13·8631	14·8944	100	·5000	·5000	·5000
55	21·3650	13·4205	14·4461				

Table J.—(*continued.*)

Expectation of Life.

Age.	No. 4. Bakers. Rural Districts, Towns and Cities.	No. 5. Miners. Rural Districts, Towns & Cities.	No. 6. Rural Districts, after Abstracting Labourers.	Age.	No. 4. Bakers. Rural Districts, Towns & Cities.	No. 5. Miners. Rural Districts, Towns & Cities.	No. 6. Rural Districts, after Abstracting Labourers.
10	47·9816	48·5160	50·7552	56	16·2677	13·7412	18·6229
11	47·1704	47·7069	49·8711	57	15·7171	13·2077	17·9726
12	46·3562	46·8949	48·9847	58	15·1686	12·7149	17·3289
13	45·5423	46·0832	48·1190	59	14·6187	12·2644	16·6938
14	44·7323	45·2750	47·2957	60	14·0632	11·8590	16·0696
15	43·9287	44·4738	46·5349	61	13·4982	11·5012	15·4578
16	43·1353	43·6831	45·8567	62	12·9205	11·1943	14·8599
17	42·3547	42·9052	45·2802	63	12·3405	10·9205	14·2781
18	41·5807	42·1417	44·7722	64	11·7673	10·6619	13·7141
19	40·8068	41·3967	44·2980	65	11·2086	10·4012	13·1690
20	40·0268	40·6700	43·8255	66	10·6718	10·1208	12·6453
21	39·2355	39·9630	43·3227	67	10·1629	9·8028	12·1415
22	38·4274	39·2781	42·7588	68	9·6779	9·4554	11·6585
23	37·6134	38·5999	42·1456	69	9·2130	9·0855	11·1961
24	36·8031	37·9134	41·4957	70	8·7647	8·7000	10·7536
25	36·0057	37·2047	40·8215	71	8·3292	8·3043	10·3310
26	35·2305	36·4607	40·1341	72	7·9028	7·9048	9·9274
27	34·4857	35·6692	39·4457	73	7·4856	7·5043	9·5405
28	33·8398	34·8451	38·7541	74	7·0775	7·1057	9·1679
29	33·0556	34·0032	38·0580	75	6·6637	6·6730	8·8070
30	32·3572	33·1573	37·3557	76	6·2872	6·2805	8·4554
31	31·6605	32·3201	36·6463	77	5·8995	5·8937	8·1108
32	30·9597	31·5034	35·9283	78	5·5238	5·5174	7·7750
33	30·2455	30·6987	35·2035	79	5·1618	5·1545	7·4499
34	29·5094	29·8978	34·4739	80	4·8168	4·8085	7·1374
35	28·7434	29·0930	33·7408	81	4·4904	4·4815	6·8539
36	27·9398	28·2770	33·0059	82	4·1749	4·1743	6·5552
37	27·0927	27·4435	32·2706	83	3·8877	3·8868	6·2784
38	26·2210	26·6009	31·5333	84	3·6195	3·6185	5·9964
39	25·3429	25·7574	30·7933	85	3·3687	3·3675	5·6913
40	24·4756	24·9204	30·0496	86	3·1343	3·1329	5·3516
41	23·6309	24·0960	29·3010	87	2·9159	2·9134	4·9740
42	22·8249	23·2900	28·5463	88	2·7123	2·7092	4·5651
43	22·0738	22·5042	27·7893	89	2·5249	2·5209	4·1389
44	21·3936	21·7382	27·0333	90	2·3531	2·3492	3·7130
45	20·7992	20·9930	26·2812	91	2·1991	2·1920	3·2998
46	20·3060	20·2680	25·5357	92	2·0655	2·0574	2·8994
47	19·9306	19·5639	24·7993	93	1·9494	1·9379	2·5320
48	19·6301	18·8763	24·0729	94	1·8455	1·8280	2·1839
49	19·3638	18·2011	23·3568	95	1·7256	1·7018	1·8603
50	19·0910	17·5346	22·6512	96	1·5897	1·5448	1·5618
51	18·7710	16·8730	21·9568	97	1·3888	1·3421	1·2965
52	18·3646	16·2135	21·2738	98	1·1666	1·1000	1·0487
53	17·8918	15·5645	20·6004	99	·8333	·8333	·8401
54	17·3722	14·9176	19·9351	100	·5000	·5000	·5000
55	16·8251	14·3131	19·2764				

high ratio which the numbers of the class compared bear to the total number. For example :—

Let a = 20 per cent. and represent the total results or general average; and
... b = 25 } per cent. and represent classes composing the general average a;
... c = 15 }

then, if either class b or class c were compared with the total result or general average, the apparent difference would be only 5 per cent.; while the actual difference between it and the residue class is 10 per cent. Hence, if any class of results be compared with the general results in which that is also included, the apparent difference will always be less than the actual difference, whether the effect of that class be to increase or decrease the ratio of the general results.

The facts forming Table I, No. 1, have therefore been eliminated from the general results for the Rural Districts in Table E, and the residue formed into another Life Table, from which Table I, No. 6, has been deduced; and it will be found that the specific intensity for the Rural Districts generally is as high

at Age	20	in Table F Rural Districts	as at Age	16	for the Residue.
	30	... ...		16	....
	40	... ...		35	...
	50	... ...		48	...
	60	... ...		58	...
	70	... ...		69	...

The corresponding points of equal specific intensity for the Residue at

Age	20	in Table I, No. 6, is as high as	Age	52 for Labourers in Table I, No. 1;
	30	... ...		44
	40	... ...		48
	50	... ...		55
	60	... ...		65
	70	... ...		72

Half the population dies off at Age 65–66 in the Residue, at Age 68–9 in the General Average, and at Age 71–2 in the Labourers.

The great distinction between the value of life among the labouring population in the Rural Districts, and the rest of the Rural Districts, is therefore obvious; and conclusively shews, that even in the same locality, in the Rural Districts of the country, where all the supposed contaminating influences of ill-ventilated houses, narrow streets, bad sewerage, poisoned air, epidemic town fevers, and factory restraints, are absent, there is nevertheless a very great superiority in the value of life in one class over another. In the

Rural Districts recited in the early part of this Paper, very little difference can be supposed to exist between the means of support and the various habits of life of the members of Friendly Societies. In fact, they may be presumed to assimilate as near to each other's condition as any means of classification can suggest, the only difference between the individual members being difference of employment or occupation; and therefore, in classifying the various trades, pure elements may be said to be brought into comparison, the only distinction being difference of occupation.

It has already been stated that any thing like a complete inquiry into the influence of employment on health is not contemplated in this Paper. A few illustrations only will be brought forward to aid the other branch of the inquiry, and by which it will be seen that, independently of locality, difference of employment has a marked effect on the duration of life.

If this position can be fairly established, it will follow as a direct consequence, that wherever an excess of unhealthy trades are congregated, there must also be an increased rate of mortality independent of the local influence; for if the same trades were placed in any other district, there would still be an increased rate of mortality simply in virtue of the trade or occupation.

At Ages 30–35, the general mortality of the Town Districts exceeds that of the Rural by 14·981 per cent. of the whole mortality at that period of life; but if the class designated Labourers were abstracted from the Rural District, the mortality of the residue would be increased 6·181 per cent. of the original ratio. But suppose a still further change to take place, and that the class named Labourers is not only abstracted from the Rural Districts, but added to the Town Districts; this arrangement would affect the respective mortalities to such an extent, that instead of the mortality of the Town Districts exceeding that of the Rural Districts by 14·981 per cent., it would fall short of it by 1·831 per cent. of the whole mortality at that period of life. In like manner also would other periods of life be affected. It is evident, therefore, that the Residue of the population in the Rural Districts has a factitious value assigned to it, from being mixed up with the class called Labourers; and that in any attempt to discover the relative values of life in different localities, unless employment were made an element in the comparison, an undue value would be attached to a great portion of life in the Rural Districts. The nature of the Rural Districts is such, that a great proportion of the upgrown population must consist of Agricultural and other Labourers. In the facts here collected, they amount to 33 per cent.; and their lives being of higher value than the average lives in the district, it is no more fair to judge of the value of life and the influence of locality on the residue of the population from calculations involving the consideration of all the lives generally, than it would be just to compare the value of life in the Residue in the preceding illustration with Town

life, and draw the conclusion that life in the Rural Districts was of less value than in the Town Districts; for in both cases a factitious value is assigned, by being mixed up with a favourable class.

From the preceding remarks it is evident that in particular occupations, even in the Rural Districts, life is of less value than in others. Those occupations cannot be said to be less healthy from the objectionable features peculiar to large Towns and Cities, for they must be supposed under very favourable circumstances for prolonged life. In Table H, No. 4, is given the expectation of life in sixteen trades in the Rural District, selected at random, without any previous knowledge as to whether they were healthy or otherwise. An inspection of this Table will shew, that in those sixteen trades, (namely, Plumbers Painters and Glaziers, Weavers, Butchers, Millwrights, Stonemasons, Cabinetmakers, Printers, Bakers, Bricklayers, Wheelwrights, Tailors, Cordwainers and Shoemakers, Sawyers, Clerks, Carpenters and Joiners, and Blacksmiths,) the value of life is less than the average for the whole Rural Districts; and Labourers were before shewn to be more healthy than the average results. It is therefore clear, that if a given District were chiefly made up of the class whose lives are above the average value, or of those below it, that the general results for that District would be of high or low value accordingly.

A very small portion of the population in either the Town or City Districts can follow agricultural pursuits; and therefore the standard of life in those Districts will be lowered in consequence of that circumstance alone; but on further examination it will be found that the comparative value of life in those Districts is not only lowered in consequence of the absence of many of the most healthy occupations common to the Rural Districts, but that it is still further decreased by the presence of some of the most unhealthy employments, not to be found, or at least to a very limited extent, in the Rural Districts. In other words, the effect of the occupations is such, that if the same people were placed in the Rural Districts, no matter over how much surface they were spread, in order to avoid the influence supposed to connect itself with the congregation of large numbers into towns, still the mortality would be much higher among the people thus conditioned, than among the average of the rural population in ordinary circumstances.

If the view brought forward be correct, that the mortality of Towns and Cities is increased from the existence of a high proportion of trades which are in themselves unhealthy, independent of the influence of the locality, it should follow that the difference found by a comparison of the rate of mortality of a given number of trades in one district, with that of the same trades in another district, should be less than the difference between the rates of mortality for the general results of the same districts. If the differences of the decennial periods from 10 to 70 in the general results for Rural and Town Districts be taken, the sum of the differences will be found to amount to 19·3299 years; but the sum of the differences at the corresponding periods for the 16 Trades formerly referred to is

only 16·3868 years; being less than the other by about 15 per cent. For a like reason it should follow, that if the differences at the same periods between the 16 Trades, and the general results of each district be taken, they should amount to less in the Town than in the Rural Districts; and accordingly in the Rural Districts the sum of the differences is found to be 4·7029 years, while in the Town Districts it is only 1·7598 years.

In order to afford still further evidence of the effect on the average value of life by the prevalence of particular trades, a few other cases will be submitted; and to render the illustrations more simple they will be given for the average of the Three Districts, or rather with the Three Districts conjoined; and consequently they must be brought into comparison with the General Results for the Three Districts as given in Tables F and C.

An inspection of Table I will shew that the equation of life in Miners is at Ages 61–2; in Bakers, at Ages 59–60; Plumbers Painters and Glaziers, at 56–7; and Clerks, at so early a period of life as 51–2. In F, for the Three Districts combined, the same results appeared at Ages 66–7, shewing a difference of 5, 7, 10, and 15 years respectively; and the following Abridgement of Table J will shew the marked difference in the expectation of life in these employments at five decennial periods.

Age.	Rural, Town, and City Districts. G.	Clerks. J, No. 2.	Plumbers, Painters, and Glaziers. J, No. 3.	Bakers. J, No. 4.	Miners. J, No. 5.
20	43·7736	31·8347	36·9040	40·0268	40·6700
30	36·6051	27·5761	30·5082	32·3572	33·1573
40	29·3306	21·8573	24·3046	24·4756	24·9204
50	22·1920	16·0465	17·0955	19·0910	17·5346
60	15·6942	12·4264	12·1675	14·0632	11·8590

The very remarkable difference between the above employments and the General Results, cannot fail to occasion some surprise; and at the same time conclusively prove, that any district containing a majority of the above, or other equally unhealthy employments, must shew a very reduced average value of life for the district, independent of the influence of the local situation itself on health.

It will no doubt cause some uneasiness in the minds of inquirers to find, that so highly important and industrious a class of men as Clerks should stand lowest in the scale of the above employments; and that from 20 to 60 their expectation of life should be only 75 per cent. of the general average. A solution of this will hereafter appear. The expectation of life among Plumbers Painters and Glaziers in the same period is equal to 81 per cent., Miners 85 per cent., and Bakers 88 per cent. of the general average.

Plumbers Painters and Glaziers will be found next in the scale; and although much

below the general average, they are still of considerably higher value than the class designated Clerks.

Bakers, as well as the preceding class, have long been supposed to be unhealthy: and although no attempt had hitherto been made to ascertain the precise value of their lives, it is thought that the present results will shew a much greater difference than would be generally calculated upon. The class Miners will be found to rank above the three others at the early periods of life, but below them at the latter periods of life.

The remark formerly made should be here kept clearly in view, that the difference found by a comparison of any class with the general results will always be less than the actual difference; and therefore the effect which the preceding and other unhealthy employments have in reducing the average rate of mortality, is still greater than what appears by the preceding Table.

Some large towns or cities are known to represent a less value of life to their inhabitants generally than other towns; and the explanation usually given of this difference has been the favourable or unfavourable nature of the locality, and a change in the sanitary regulations of the place looked forward to as a certain remedy; but a minute examination of all the external circumstances affecting life will shew, that the great diversity in the mortality of certain classes arises from the influence of other agents. In Table H, No. 2, is given the expectation of life calculated from the combined data of all trades in Liverpool; and a comparison of this with the general results for the Rural Districts will shew a much greater difference due to locality in the apparent sense, than has hitherto been shewn by any other tables of the value of life in different localities; but at the same time it will be seen that this difference falls much short of the actual difference between different employments. At Age 30 the difference between the expectation of life in the Rural Districts and in Liverpool is 8·2636 years; but the difference between Clerks and Labourers is 13·0211 years; and so also at other periods of life. It ought to be understood, that in making this comparison, the influence of employment is shewn to disadvantage; for, as has been already pointed out, every large town has its average lowered by the influence of certain trades; and therefore the actual difference in the above comparison between the Rural Districts and Liverpool is less than there given: and again, in the comparison between Clerks and Labourers, the expectation for Clerks has been for the average of the three districts; but if it had been taken for the City Districts only, a much greater difference would have been found, and consequently the influence of employments appeared the greater.

From Table K, No. 2, it will appear that there is a uniform decrease in the specific intensity of life from the commencement to the end of the table. A comparison will shew that the specific intensities at ages 30, 40, and 50, correspond with the specific intensities at ages

[45, 54,

Table K, No. 1.

Rural, Town and City Districts.—Trades not Classified.—*Females.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	1389	1·3888	71·994	56	62073	1061	1·7094	58·514
11	98611	1370	1·3888	71·994	57	61012	1039	1·7021	58·754
12	97241	1334	1·3715	72·886	58	59973	1020	1 7002	58·824
13	95907	1282	1·3368	74·794	59	58953	1004	1·7037	58·685
14	94625	1216	1·2848	77·821	60	57949	992	1·7126	58·377
15	93409	1135	1·2155	82·237	61	56957	984	1·7269	57·904
16	92274	1042	1·1288	88·574	62	55973	1024	1 8294	54·675
17	91232	951	1·0429	95·877	63	54949	1110	2·0202	49·505
18	90281	865	·9579	104·395	64	53839	1238	2·2991	43·497
19	89416	781	·8736	114·469	65	52601	1403	2·6663	37·509
20	88635	700	·7902	126·550	66	51198	1598	3·1216	32·031
21	87935	622	·7076	141·323	67	49600	1792	3·6120	27·685
22	87313	569	·6521	153·351	68	47808	1978	4·1375	24·166
23	86744	541	·6237	160·334	69	45830	2153	4·6980	21·286
24	86203	537	·6224	160·668	70	43677	2312	5·2936	18·889
25	85666	555	·6482	154·273	71	41365	2451	5·9242	16·880
26	85111	597	·7010	142·653	72	38914	2491	6·4013	15·623
27	84514	621	·7349	136·073	73	36423	2449	6·7247	14·870
28	83893	629	·7499	133·351	74	33974	2342	6·8945	14·503
29	83264	621	·7462	134·012	75	31632	2186	6·9106	14·470
30	82643	598	·7237	138·179	76	29446	1995	6·7731	14·765
31	82045	560	·6825	146·520	77	27451	1870	6·8123	14·680
32	81485	539	·6618	151·103	78	25581	1797	7·0282	14·229
33	80946	535	·6615	151·172	79	23784	1765	7·4207	13·475
34	80411	548	·6816	146·714	80	22019	1759	7·9899	12·516
35	79863	577	·7221	138·485	81	20260	1770	8·7357	11·447
36	79286	621	·7830	127·714	82	18490	1751	9·4684	10·562
37	78665	658	·8367	119·517	83	16739	1705	10·1880	9·814
38	78007	689	·8833	113·212	84	15034	1637	10·8946	9·183
39	77318	713	·9227	108·378	85	13397	1553	11·5880	8·628
40	76605	732	·9550	104·712	86	11844	1453	12·2683	8·150
41	75873	744	·9800	102·041	87	10391	1335	12·8507	7·782
42	75129	758	1·0085	99·108	88	9056	1316	14·5351	6·878
43	74371	774	1·0402	96·154	89	7740	1294	16·7216	5·981
44	73597	791	1·0754	93·023	90	6446	1251	19·4102	5·152
45	72806	811	1·1139	89·767	91	5195	1174	22·6008	4·425
46	71995	832	1·1557	86·505	92	4021	1069	26·5925	3·759
47	71163	861	1·2095	82·645	93	2952	881	29·8333	3·352
48	70302	897	1·2753	78·431	94	2071	684	33·0399	3·027
49	69405	939	1·3531	73·910	95	1387	504	36·3589	2·750
50	68466	988	1·4428	69·300	96	883	350	39·6498	2·522
51	67478	1042	1·5444	64·767	97	533	241	45·1555	2·214
52	66436	1078	1·6232	61·614	98	292	155	52·9127	1·890
53	65358	1097	1·6791	59·559	99	137	84	61·3067	1·631
54	64261	1100	1·7121	58 411	100	53	53	75·0000	1·333
55	63161	1088	1·7222	58·072					

Table K, No. 2.

Trades not Classified.—Liverpool.—*Males.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	396	·3961	252·462	56	53834	1751	3·2529	30·741
11	99604	395	·3961	252·462	57	52083	1741	3·3422	29·922
12	99209	401	·4038	247·647	58	50342	1810	3·5961	27·809
13	98808	414	·4193	238·493	59	48532	1949	4·0148	24·907
14	98394	435	·4425	225·989	60	46583	2142	4·5981	21·749
15	97959	464	·4735	211·193	61	44441	2376	5·3461	18·706
16	97495	499	·5123	195·198	62	42065	2501	5·9445	16·821
17	96996	522	·5379	185·908	63	39564	2529	6·3933	15·642
18	96474	531	·5506	181·620	64	37035	2479	6·6925	14·943
19	95943	528	·5501	181·785	65	34556	2364	6·8421	14·616
20	95415	512	·5367	186·324	66	32192	2203	6·8421	14·616
21	94903	484	·5101	196·040	67	29989	2062	6·8761	14·543
22	94419	478	·5061	197·589	68	27927	1939	6·9441	14·401
23	93941	493	·5247	190·585	69	25988	1831	7·0461	14·192
24	93448	529	·5657	176·772	70	24157	1735	7·1821	13·924
25	92919	585	·6294	158 881	71	22422	1649	7·3522	13·602
26	92334	661	·7155	139·762	72	20773	1582	7·6148	13·132
27	91673	722	·7872	127·033	73	19191	1530	7·9700	12·547
28	90951	768	·8443	118·441	74	17661	1487	8·4178	11·879
29	90183	800	·8870	112·740	75	16174	1449	8·9582	11·632
30	89383	818	·9151	109·278	76	14725	1412	9·5911	10·426
31	88565	823	·9288	107·666	77	13313	1380	10·3620	9·653
32	87742	840	·9576	104·428	78	11933	1345	11·2708	8·873
33	86902	871	1·0017	99·800	79	10588	1304	12·3175	8·117
34	86031	913	1·0611	94·251	80	9284	1254	13·5021	7·407
35	85118	967	1·1356	88·028	81	8030	1190	14·8247	6·748
36	84151	1031	1·2254	81·633	82	6840	1111	16·2427	6·158
37	83120	1090	1·3108	76·278	83	5729	1017	17·7563	5·631
38	82032	1142	1·3918	71·839	84	4712	913	19·3654	5·163
39	80888	1188	1·4685	68·074	85	3799	809	21·0700	4·746
40	79700	1228	1·5407	64·893	86	2999	686	22·8702	4·373
41	78472	1262	1·6086	62·150	87	2313	574	24·7975	4·032
42	77210	1302	1·6863	59·312	88	1739	467	26·8519	3·724
43	75908	1346	1·7737	56·370	89	1272	378	29·0335	3·445
44	74562	1395	1·8709	53·447	90	894	280	31·3423	3·191
45	73167	1447	1·9778	50·556	91	614	207	33·7782	2·960
46	71720	1502	2·0945	47·733	92	407	147	36·0224	2·776
47	70218	1569	2·2339	44·763	93	260	99	38·0748	2·627
48	68649	1645	2·3960	41·736	94	161	64	39·9356	2·504
49	67004	1729	2·5808	38·745	95	97	40	41·6047	2·404
50	65275	1820	2·7883	35·868	96	57	25	43·0820	2·321
51	63455	1915	3·0185	33·124	97	32	15	47·3179	2·113
52	61540	1962	3·1876	31·368	98	17	9	53·9970	1·852
53	59578	1964	3·2956	30·340	99	8	5	61·3067	1·631
54	57614	1926	3·3425	29·913	100	3	3	75·0000	1·333
55	55688	1854	3·3282	30·048					

45, 54, and 63 in the Rural Districts; Ages 38, 49, and 57 in the Towns; Ages 29, 42, and 59 in the Cities; and at Ages 39, 51, and 61 in the Three Districts combined. A further inspection of the same table will shew that half the population dies off between the ages 58–9,—an earlier period than in the City Districts of Table F by 3 years.

In Table H, No. 2, the expectation of life for all trades in Liverpool will be found to be lower than the expectation given in Table G for the City Districts generally. The following shews the difference at decennial periods of Life.

Age.	City Districts. Table G.	Liverpool.	Difference.
20	40·0148	37·9553	2·0595
30	32·8603	30·1437	2·7166
40	26·0873	23·1524	2·9349
50	19·9271	17·0946	2·8325
60	13·7685	11·9626	1·8059

So far as a general inspection of the above results would suffice, it might be inferred that Liverpool is less healthy than the average of the large cities in England; but it is necessary here again to keep in view the peculiar aggregation of employments which are in themselves unhealthy, independent of the locality; for it so happens, that the class of Labourers in large cities is subject to a very high rate of mortality, and that the peculiar business of Liverpool occasions a great preponderance of that class in the dock, and other employments of that kind, a large proportion of which enters into the above results.

It has been shewn in Table F, for the Three Districts, that the expectation of life for Members of Friendly Societies over the country generally, is higher than that for the whole population of England and Wales as given in Table D. In like manner it will also be found, that the expectation of life among the Members of Friendly Societies in Liverpool is also higher than the expectation for the general population of Liverpool.

At page XXVII. of the 5th Report of the Registrar General will be found a table of the Expectation of Life for the Town of Liverpool; and assuming that it gives a correct representation of the value of life of the whole population, we shall find the comparative value of life between the Members of Friendly Societies and the general population in the following Table :—

Age.	Expectation of Life in Liverpool.		Difference in favour of Friendly Societies in Liverpool.	
	Friendly Societies.	Whole Population.	In Years.	Per Cent.
20	37·9553	33 0000	4·9553	15·0160
25	33·9067	30·0000	3·9067	13·0223
30	30·1437	27·0000	3·1437	11·6433
35	26·5260	23·0000	3·5260	15·3303
40	23·1524	21·0000	2·1524	10·2500
45	19·9908	18·0000	1·9908	11·0600
50	17·0946	16 0000	1·0946	5·6922

A careful consideration of all the preceding observations, it is believed, will be sufficient to shew that the excessive mortality of the general population of Liverpool must be due to some other cause than simply that of locality. The persons over whom the observations in the first column extend, being members of Friendly Societies, and almost exclusively workmen and mechanics, of necessity inhabit the inferior class of houses, in the worst conditioned streets; and it is therefore impossible that they can escape the contagious effect of the pestilential diseases supposed to be the scourge of unhealthy neighbourhoods: and admitting this, the results given for the Friendly Societies must evidence all the legitimate effects due to locality; and therefore the excessive mortality of the general population is due to some other cause—such as the poverty and distress which, unhappily, are allowed to remain so much neglected in the large manufacturing and commmercial towns of the kingdom. If any part of this argument were to be met by the statement, that the higher expectation of life given for the members of Friendly Societies in Liverpool than for the general community, may be accounted for by the omission of some very unhealthy trades; this would be sufficiently answered by the fact, that 175 employments are included, and, as has already been shewn, some of them the most unhealthy occupations; so that a fair average may be said to be taken. A similar objection might also seem to apply against the general results for the whole kingdom; but if it is recollected that upwards of four hundred trades are included, the force of the objection will disappear.

It is evident from all that has been said, that the peculiar sanitary condition of large towns has not the remarkable effect which many have supposed in shortening the duration of life; still, it has some effect, and the nature and extent of that influence it is important to understand. But a rude estimate only can be made, until the value of life in every important employment, occupation, or trade has been investigated, for the various localities or districts, on some such plan as that given in the present paper; and then grouping or classifying a given number of these common to different localities: the result arrived at would shew the precise amount of influence which a particular District, City, or Town, has on the duration of life. A partial or limited comparison of a few trades would not be adequate to answer definitely this question, but an accurate combination of a sufficiently large number of trades, to guard against the effect of fluctuation.

In the beginning of this Paper it was stated, that to carry out the question in this extended degree was a task of too imposing a nature on the present occasion; and that such illustrations would only be brought forward, as would be necessary to solve the more immediate question.

On the general mortality of large towns especially, little confidence should be placed, even although every other precaution as to distinction of age and other conditions be taken; for fallacies from two sources are apt to enter:—First, if, in comparisons of large towns,

precisely the same classes of trades do not exist, errors will arise from that circumstance;—and in the second place, although the same classes of trades do exist in both places, unless the proportionate numbers to the whole population be the same, errors in the result must arise. The nature of the error in the first case is plain, from the fact that different trades are in the same place influenced by different rates of mortality; and if any given trade is wanting, its tendency to alter the general average will be lost. The error in the second case is of a like nature; for if the absence of the whole class affect the general result, the absence of a fraction of that class must also affect it, although not to the same extent. Illustrations confirmatory of this have already been given when discussing the influence of the class of Labourers, and also the Sixteen Trades combined, on the general averages for the respective Districts; and a recurrence to those illustrations will be sufficient to shew the truth of the present observations.

An inspection of Table K, No. 1, will shew the Rate of Mortality for Female Life among the Members of Friendly Societies in England and Wales, for the Rural, Town, and City Districts combined. The Tables for Male and Female Life here given, seem to possess in many respects the same relation as those given for Male and Female Life generally in England and Wales; the Specific Intensity at the earlier periods being higher for Male than Female Life, crossing each other at the middle periods, and turning in favour of Female Life at the advanced ages. It will be seen that the Male Population of Table F for the Three Districts is bisected at 66–7, and that the Female Population in Table K, No. 1, is also bisected at the same period of life. In the general population of the country the same thing takes place a year later among Females than among Males.

The Expectation for Female Life, for the general results of Friendly Societies, will be found in Table H, No. 1; and the following Abstract will shew the relative value of Male and Female Life in the country generally, as well as in Friendly Societies:—

Age.	Expectation of Life in England and Wales.			Expectation of Life among the Members of Friendly Societies.		
	Males.	Females.	Difference.	Males.	Females.	Difference.
20	40·6910	41·5982	·9072	43·7736	45·2640	1·4904
30	34·0990	35·1671	1·0681	36·6051	38·1841	1·5790
40	27·4760	28·7330	1·2570	29·3306	30·7813	1·4507
50	20·8463	22·0545	1·2082	22·1920	23·8200	1·6280
60	14·5854	15·5230	·9396	15·6942	17·2380	1·5438
70	9·2176	9·8409	·9376	10·2057	10·9750	·7693

It will thus be seen, that the distinction between Male and Female Life among the Members of Friendly Societies, differs very little from that between the sexes in the country generally; and this difference would be considerably reduced if the necessary corrections for employments were made, as the data for Male Life in Friendly Societies

will be composed of a much higher proportion of unhealthy trades, in relation to the whole male population of the country, than the data for Female Life in comparison to the whole female population. This coincidence of course tends to strengthen the confidence to be reposed in both classes of results, and brings forward an additional argument against the sufficiency of certain inquiries hitherto made, shewing in some instances so wide a distinction between the value of life in the sexes.

In a subsequent portion of the present edition of these contributions a large amount of additional data will be found introduced, bearing directly on particular classes of society, and supporting in a very decided and conclusive manner the views developed by the preceding facts as given in the first and second editions. It is, however, thought better not to interfere with the original course of argument by introducing the new matter at this place, and it is consequently reserved for a more advanced part of this paper.

DURATION OF LIFE IN SCOTLAND.

A SEPARATE set of returns was procured from Societies in Scotland, and the facts embodied in them have been combined into a distinct class of tables, to which reference will be presently made. The results thus derived will be of the more importance, as serving to confirm those obtained from the English Societies; and their value in this respect is enhanced by the fact, that the Scotch returns extend over a period of twelve years, while those by the English Societies were limited to five years. The Scotch returns were also made under quite different circumstances from those of the English, and they thus act as checks on each other. The nature and extent of the original form in which the information was furnished by the returns from Scotland, have already been referred to.

TABLE L represents the results for the Scotch Societies, in precisely the same manner that Table E did for the English Societies. The places forming the respective Districts in Scotland will be found in the Appendix, Note III.

TABLES M and N were subsequently formed from Table L, in the same manner in which Tables C and D were formed from B, and Tables F and G from E. An inspection of TABLE M for the Rural Districts, will shew that the Specific Intensity increases in a uniform ratio, from the earliest age in the Table to the extreme of life. A comparison with the Rural Districts of England (Table F) will shew a higher Specific Intensity in the Rural Districts of Scotland till age 34; but from that till age 54 it is lower in Scotland, and from 54 to the end of the Tables the Specific Intensity is sometimes higher and sometimes lower. A more general and comprehensive view of the two Tables will be obtained by comparing the Equation of Life: for age 10 it takes place between the ages 67–8 in the Rural Districts in Scotland, but between ages 68–9 in England. Again the Equation for age 30 takes place in both Tables between 70 and 71. Considering the different sources from which the data of the two Tables are derived, and the different periods of years over which the observations extend, the agreement of the Tables in this respect is somewhat remarkable.

[In the Town of

Table L.

Trades not Classified.—Scotland.—Rural Districts.

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
10	...	...	...	...	...	...	...	...	10
11	2								11
12	5								12
13	6	33	...	...	...	...	...	...	13
14	8								14
15	12								15
16	37		...			7·714			16
17	83		1			48·428			17
18	162	906	1	6	0·6623	128·714	802·713	0·8860	18
19	264		1			261·143			19
20	360		3			356·714			20
21	488		1			496·286			21
22	610		5			496·571			22
23	717	3573	4	24	0·6717	521·428	3070·570	0·8594	23
24	804		7			690·714			24
25	954		7			865·571			25
26	1067		4			964·286			26
27	1161		10			983·000			27
28	1220	6058	10	41	0·6768	817·000	4645·000	0·7667	28
29	1290		6			862·286			29
30	1320		11			1018·428			30
31	1364		11			911·857			31
32	1372		8			827·857			32
33	1357	6770	12	45	0·6647	1037·000	4881·428	0·7210	33
34	1336		5			941·714			34
35	1341		9			1163·000			35
36	1372		14			1180·428			36
37	1360		17			1253·714			37
38	1341	6774	3	58	0·8562	998·571	5806·855	0·8572	38
39	1362		15			1172·714			39
40	1339		9			1201·428			40
41	1335		14			1412·571			41
42	1277		10			1112·714			42
43	1227	6211	10	53	0·8533	1212·286	6580·428	1·0595	43
44	1191		11			1435·571			44
45	1181		8			1407·286			45
46	1172		7			1519·571			46
47	1144		20			1653·714			47
48	1128	5623	12	65	1·1559	1495·857	7538·713	1·3407	48
49	1105		11			1414·714			49
50	1074		15			1454·857			50

Table L.—(*continued.*)

Trades not Classified.—Scotland.—Rural Districts.

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
51	1015		12			2014·714			51
52	979		13			2212·286			52
53	914	4630	14	61	1·3175	1830·857	10481·999	2·2639	53
54	888		10			2227·428			54
55	834		12			2196·714			55
56	791		16			2189·571			56
57	720		11			2181·000			57
58	709	3543	16	72	2·0322	1918·714	10844·285	3·0608	58
59	681		10			2220·286			59
60	642		19			2334·714			60
61	600		11			2125·000			61
62	552		13			2628·286			62
63	497	2497	23	84	3·3640	2197·428	12585·143	5·0401	63
64	446		18			2788·286			64
65	402		19			2846·143			65
66	347		11			3091·428			66
67	308		11			3245·286			67
68	282	1418	9	56	3·9490	2786·714	15388·713	10·8525	68
69	260		10			3017·857			69
70	221		15			3247·428			70
71	199		13			2679·286			71
72	164		12			2559·286			72
73	143	759	8	45	5·9289	2680·000	13450·000	17·7207	73
74	126		2			2585·571			74
75	127		10			2945·857			75
76	105		6			2560·428			76
77	98		7			2531·000			77
78	81	432	5	26	6·0185	2255·714	11611·999	26·8796	78
79	78		5			2180·857			79
80	70		3			2084·000			80
81	59		5			1837·714			81
82	51		11			1547·000			82
83	36	187	6	30	16·0248	1035·143	5463·714	29·2123	83
84	25		6			643·286			84
85	16		2			400·571			85
86	14		3			423·428			86
87	9		2			294·428			87
88	7	37	1	8	21·6216	236·571	1190·713	32·1814	88
89	4		1			143·143			89
90	3		1			93·143			90
91	1		1			2·000			91
92	...		...			...			92
93	...	1	...	1	100·0000	...	2·000	2·0000	93
94	...		...			...			94
95	...		...			...			95
		49452		675	1·3705		114344·273	2·3216	

Table L.—(*continued.*)

Trades not Classified.—Scotland.—Towns.

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
10	7	7	...	...	...	...	...	...	10
11	15		...			2·428			11
12	19		...			12·000			12
13	17	99	...	...	...	10·286	29·000	0·2929	13
14	21		...			...			14
15	27		...			4·286			15
16	38		1			24·143			16
17	57		...			28·714			17
18	86	436	...	3	0·6881	91·857	345·856	0·7930	18
19	120		1			100·428			19
20	135		1			100·714			20
21	176		2			157·286			21
22	206		3			271·571			22
23	243	1154	1	7	0·6066	245·714	1153·999	0·9999	23
24	253		1			187·428			24
25	276		...			292·000			25
26	303		1			336·286			26
27	314		...			387·286			27
28	334	1629	2	8	0·4911	421·286	1745·572	1·0716	28
29	343		4			339·000			29
30	335		1			261·714			30
31	306		3			312·571			31
32	338		...			272·428			32
33	333	1551	3	12	0·7737	276·000	1401·284	0·9035	33
34	324		4			251·714			34
35	250		2			288·571			35
36	289		4			219·714			36
37	268		2			242·000			37
38	253	1230	3	13	1·0569	303·857	1275·285	1·0368	38
39	222		2			266·000			39
40	198		2			243·714			40
41	179		3			169·143			41
42	160		1			174·000			42
43	150	744	...	6	0·8064	161·000	747·714	1·0050	43
44	130		1			146·571			44
45	125		1			97·000			45
46	120		5			163·571			46
47	99		...			189·714			47
48	93	471	3	10	2·1231	201·000	837·285	1·7777	48
49	85		1			151·000			49
50	74		1			132·000			50

Table L.—(*continued.*)

Trades not Classified.—Scotland.—Towns.

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
51	75		...			74·000			51
52	69		...			117·000			52
53	63	319	...	2	0·6270	101·000	533·000	1·6708	53
54	57		1			125·000			54
55	55		1			116·000			55
56	44		2			78·000			56
57	41		...			39·000			57
58	42	199	1	4	2·0101	28·000	227·000	1·1407	58
59	39		...			50·000			59
60	33		1			32·000			60
61	31		...			32·000			61
62	28		...			22·000			62
63	24	126	...	4	3·1746	53·428	259·428	2·0589	63
64	24		4			57·000			64
65	19		...			95·000			65
66	16		3			127·000			66
67	16		1			89·000			67
68	13	64	2	7	10·9375	59·000	461·000	7·2031	68
69	12		1			124·000			69
70	7		...			62·000			70
71	8		...			73·000			71
72	7		...			35·000			72
73	8	36	...	1	2·7777	140·000	474·000	13·1666	73
74	7		1			114·000			74
75	6		...			112·000			75
76	7		1			104·286			76
77	7		...			71·000			77
78	7	25	2	4	16·0000	109·000	353·286	14·1314	78
79	2		1			17·000			79
80	2		...			52·000			80
81	2		...			52·000			81
82	2		...			52·000			82
83	2	11	...	1	9·0000	...	142·000	12·9090	83
84	3		...			...			84
85	2		1			38·000			85
86	1		...			52·000			86
87	1		...			25·000			87
88	1	5	...	...	...	52·000	233·000	46·6000	88
89	1		...			52·000			89
90	1		...			52·000			90
91	1		...			...			91
92	1		...			...			92
93	...	2	...	...	...	...	...	...	93
94	...		...			...			94
95	...		...			...			95
		8108		82	1·0113		10218·709	1·2603	

Table L.—(*continued.*)

Trades not Classified.—Scotland.—Cities.

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
10	...	...	...	...	...	...	...	...	10
11	...		...			...			11
12	...		...			...			12
13	...	...	...	...	...	...	...	...	13
14	...		...			...			14
15	...		...			...			15
16	...		...			...			16
17	1		...			...			17
18	1	21	...	...	...	...	...	...	18
19	2		...			...			19
20	17		...			...			20
21	39		...			23·286			21
22	76		1			47·714			22
23	128	645	4	10	1·5504	166·143	495·285	0·7679	23
24	174		...			117·714			24
25	228		5			140·428			25
26	288		3			177·714			26
27	343		2			262·714			27
28	387	1888	4	22	1·1653	366·286	1749·571	0·9267	28
29	424		8			515·857			29
30	446		5			427·000			30
31	476		6			430·571			31
32	494		7			456·714			32
33	515	2491	7	37	1·4853	592·143	2572·285	1·0326	33
34	500		9			621·286			34
35	506		8			471·571			35
36	505		7			515·571			36
37	506		9			444·857			37
38	461	2304	7	41	1·7795	402·857	2333·427	1·0128	38
39	432		10			502·571			39
40	400		8			467·571			40
41	383		8			477·857			41
42	353		8			545·143			42
43	320	1612	5	32	1·9852	297·714	1853·571	1·1499	43
44	291		10			318·714			44
45	265		1			214·143			45
46	262		5			415·286			46
47	256		6			455·857			47
48	246	1227	9	37	3·0155	508·857	2682·857	2·1865	48
49	232		9			571·000			49
50	231		8			731·857			50
51	223		5			746·286			51
52	224		8			768·714			52
53	211	1065	8	37	3·4742	671·571	3244·713	3·0467	53
54	211		12			570·571			54
55	196		4			487·571			55

Table L.—(*continued.*)

Trades not Classified.—Scotland.—Cities.

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
56	193		12			713·714			56
57	179		8			716·286			57
58	167	829	5	38	4·5838	597·143	3247·571	3·9175	58
59	153		6			608·714			59
60	137		7			611·714			60
61	120		5			658·857			61
62	103		7			720·714			62
63	93	462	5	21	4·5455	588·428	3065·141	6·8510	63
64	75		...			531·714			64
65	71		4			565·428			65
66	62		5			427·571			66
67	52		1			485·000			67
68	44	234	1	11	4·7009	577·857	2361·142	10·0904	68
69	41		2			503·714			69
70	35		2			367·000			70
71	30		1			526·286			71
72	29		...			698·286			72
73	26	130	2	12	9·2308	654·000	3128·572	24·0659	73
74	25		4			695·000			74
75	20		5			555·000			75
76	15		1			486·000			76
77	10		1			300·000			77
78	9	49	...	4	8·1632	316·000	1717·714	35·0554	78
79	8		1			320·000			89
80	7		1			295·714			80
81	6		1			311·000			81
82	4		...			208·000			82
83	4	16	2	3	18·7500	168·000	791·000	49·4375	83
84	1		...			52·000			84
85	1		...			52·000			85
86	1		...			52·000			86
87	1		...			52·000			87
88	...	3	...	0	0·0000	...	156·000	52·0000	88
89	...		...			...			89
90	1		...			52·000			90
91	1		...			52·000			91
92	1		...			52·000			92
93	1	5	...	0	0·0000	52·000	260·000	52·0000	93
94	1		...			52·000			94
95	1		...			52·000			95
96	1		1			41·000			96
97	...		...			...			97
98	...	1	...	1	100·0000	...	41·000	41·0000	98
99	...		...			...			99
100	...		...			...			100
		12982		306	2·3571		29699·849	2·2878	

Table L.—(*Continued.*)

Trades not Classified.—Scotland.—Rural, Town, and City Districts.

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
10	7	7	...	...	...	...	...	...	10
11	17		...			2·428			11
12	24		...			12·000			12
13	23	132	...	...	...	10·286	29·000	0·2197	13
14	29		...			...			14
15	39		...			4·286			15
16	75		1			31·857			16
17	141		1			77·143			17
18	249	1363	1	9	0·6603	220·571	1148·570	0·8427	18
19	386		2			361·571			19
20	512		4			457·428			20
21	703		3			676·857			21
22	892		9			815·857			22
23	1088	5372	9	41	0·7633	933·286	4719·857	0·8786	23
24	1231		8			995·857			24
25	1458		12			1298·000			25
26	1658		8			1478·286			26
27	1818		12			1633·000			27
28	1941	9575	16	71	0·7415	1604·571	8140·143	0·8501	28
29	2057		18			1717·143			29
30	2101		17			1707·143			30
31	2146		20			1655·000			31
32	2204		15			1557·000			32
33	2205	10812	22	94	0·8694	1905·143	8855·000	0·8190	33
34	2160		18			1814·714			34
35	2097		19			1923·143			35
36	2166		25			1915·714			36
37	2134		28			1940·571			37
38	2055	10308	13	112	1·0865	1705·286	9415·571	0·9134	38
39	2016		27			1941·286			39
40	1937		19			1912·714			40
41	1897		25			2059·571			41
42	1790		19			1831·857			42
43	1697	8567	15	91	1·0622	1671·000	9181·713	1·0717	43
44	1612		22			1900·857			44
45	1571		10			1718·428			45
46	1554		17			2098·428			46
47	1499		26			2299·286			47
48	1467	7321	24	112	1·5298	2205·714	11058·856	1·5106	48
49	1422		21			2136·714			49
50	1379		24			2318·714			50
51	1313		17			2835·000			51
52	1272		21			3098·000			52
53	1188	6014	22	100	1·6628	2603·428	14259·714	2·3711	53
54	1156		23			2923·000			54
55	1085		17			2800·286			55

Table L.—(*continued.*)

Trades not Classified.—Scotland.—Rural, Town, and City Districts.

Age.	Population.		DEATHS.			SICKNESS.			Age.
				In Periods.			In Periods.		
	At Each Age.	In Periods.	At Each Age.	Total.	Per Cent.	At Each Age.	Total.	Per Annum.	
56	1028		30			2981·286			56
57	940		19			2936·286			57
58	918	4571	22	114	2·4940	2543·857	14318·857	3·1325	58
59	873		16			2879·000			59
60	812		27			2978·428			60
61	751		16			2815·857			61
62	683		20			3371·000			62
63	614	3085	28	109	3·5332	2839·286	15909·714	5·1571	63
64	545		22			3337·000			64
65	492		23			3506·571			65
66	425		19			3646·000			66
67	376		13			3819·286			67
68	339	1716	12	74	4·3124	3423·571	18210·856	10·6123	68
69	313		13			3645·571			69
70	263		17			3676·428			70
71	237		14			3278·571			71
72	200		12			3292·571			72
73	177	925	10	58	6·2703	3474·000	17052·570	18·4352	73
74	158		7			3391·571			74
75	153		15			3612·857			75
76	127		8			3150·714			76
77	115		8			2902·000			77
78	97	506	7	34	6·7194	2680·714	13682·999	27·0415	78
79	88		7			2517·857			79
80	79		4			2431·714			80
81	67		6			2200·714			81
82	57		11			1807·000			82
83	42	214	8	34	15·8879	1202·143	6395·714	29·8865	83
84	29		6			695·286			84
85	19		3			490·571			85
86	16		3			527·428			86
87	11		2			371·428			87
88	8	45	1	8	17·7777	288·571	1579·713	35·1047	88
89	5		1			195·143			89
90	5		1			197·143			90
91	3		1			54·000			91
92	2		...			52·000			92
93	1	8	...	1	12·5000	52·000	262·000	32·7500	93
94	1		...			52·000			94
95	1		...			52·000			95
96	1		1			41·000			96
97	...		...			...			97
98	...	1	...	1	100·0000	...	41·000	41·0000	98
99	...		...			...			99
100	...		...			...			100
		70542		1063	1·5069		154261·847	2·1868	

In the Town Districts of Scotland, half the population dies off at the ages of 65-6; but in the Town Districts in England, the same thing takes place a year earlier. It is in the City Districts of Scotland that the most marked difference is found; but when it is recollected that the only places included in the list of Scotch Cities are Edinburgh, Glasgow, Paisley, and Aberdeen, and that the observations relate chiefly to the three first-named places, it will in some measure account for the very high rate of Mortality. An inspection of the City Districts of TABLE M will shew a much lower specific intensity for Scotland up to age 60, than even for Liverpool; but from that age to 80 it is higher than in Liverpool. In the City Districts for Scotland, half the population dies off between the ages of 53-4, being eight years earlier than in the City Districts of England, and five years sooner than in Liverpool, and in fact coming very close to the very worst class of results in England—namely, Clerks—in which half the population was cut off at ages 51-2. But as the numbers over which the observations extend in the City Districts in Scotland are limited, less confidence might reasonably be placed in the results, and the excessive mortality in part assigned to the fluctuation to which small numbers are subject.

On examination, however, of the various groups of results making up the whole class for the City Districts, they were, without exception, found subject to a high rate of mortality, thus carrying evidence of a higher absolute mortality than in the average of English Cities.

The results for the Three Districts combined shew a less specific intensity than in England up to age 66, and from that age upwards, the Tables cross each other. In the general results for Scotland, half of the population dies off between ages 64-5; but in the general results for England, that event is deferred two years beyond that period.

Looking next to the Expectation of Life, as given in TABLE N, it will be found that in the Rural Districts of Scotland it is less than in England by about half-a-year, from ages 20 to 75; but the Town Districts of Scotland give a higher Expectation than in England till beyond 70 years of age, and the City Districts of Scotland shew a lower Expectation of Life than Liverpool up to about 50 years of age. In order to admit of better comparison, the general results for the Three Districts in Scotland and England will be arranged as follows for decennial ages.

Age.	Expectation of Life in Friendly Societies in		Difference in favour of England in Years.
	Scotland.	England.	
20	42·7218	43·7736	1·0518
30	35·6512	36·6051	0·9539
40	28·6565	29·3306	0·6741
50	21·8122	22 1920	0·3798
60	15·0184	15·6942	0·6758
70	10·4296	10·2057	—0·2239

[From a consideration

Table M.

Rural Districts.—Scotland.

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	230	·2300	434·783	56	69492	1214	1·7463	57·274
11	99770	229	·2300	434·783	57	68278	1307	1·9139	52.247
12	99541	246	·2473	404·367	58	66971	1411	2·1062	47·483
13	99295	280	·2818	354·862	59	65560	1523	2·3232	43·948
14	99015	330	·3337	299·670	60	64037	1643	2·5649	38·986
15	98685	398	·4029	248·201	61	62394	1767	2·8312	35·323
16	98287	481	·4893	204·374	62	60627	1860	3·0677	32·594
17	97806	547	·5589	178·923	63	58767	1924	3·2744	30·544
18	97259	595	·6115	163·532	64	56843	1962	3·4511	28·977
19	96664	626	·6472	154·512	65	54881	1975	3·5980	27·793
20	96038	640	·6660	150·150	66	52906	1966	3·7150	26·918
21	95398	637	·6679	149·723	67	50940	1980	3.8878	25.720
22	94761	635	·6696	149·343	68	48960	2015	4·1164	24·295
23	94126	632	·6712	148·987	69	46945	2066	4·4007	22·722
24	93494	629	·6724	148·721	70	44879	2132	4·7509	21·038
25	92865	626	·6736	148·456	71	42747	2196	5·1369	19·467
26	92239	622	·6747	148·214	72	40551	2213	5·4573	18·325
27	91617	618	·6750	148·148	73	38338	2186	5·7020	17·538
28	90999	614	·6747	148·214	74	36152	2123	5·8712	17·033
29	90385	609	·6736	148·456	75	34029	2030	5·9647	16·764
30	89776	603	·6719	148·832	76	31999	1914	5·9826	16·714
31	89173	597	·6695	149·365	77	30085	1925	6·3979	15·630
32	88576	598	·6752	148·104	78	28160	2031	7·2106	18·868
33	87978	606	·6891	145·117	79	26129	2200	8·4207	11·875
34	87372	621	·7111	140·627	80	23929	2400	10·0282	9·970
35	86751	643	·7413	134·898	81	21529	2591	12·0330	8·313
36	86108	671	·7796	128.271	82	18938	2625	13·8601	7·215
37	85437	692	·8101	123·442	83	16313	2530	15·5093	6·447
38	34745	706	·8329	120·062	84	13783	2341	16·9807	5·889
39	84039	712	·8478	117·952	85	11442	2091	18·2743	5·473
40	83327	712	·8550	116·959	86	9351	1813	19·3900	5·157
41	82615	706	·8544	117·041	87	7538	1533	20·3326	4·919
42	81909	709	·8655	115·540	88	6005	1267	21·1019	4·739
43	81200	722	·8887	112·524	89	4738	1028	21·6980	4·608
44	80478	744	·9242	108·202	90	3710	821	22·1209	4·521
45	79734	775	·9719	102·891	91	2889	646	22·3706	4·470
46	78959	815	1·0324	96·899	92	2243	535	23·8316	4·196
47	78144	850	1·0879	91·912	93	1708	453	26·5040	3·774
48	77294	879	1·1377	87·873	94	1255	381	30·3877	3·291
49	76415	903	1·1819	84·602	95	874	310	35·4808	2·818
50	75512	922	1·2205	81·900	96	564	236	41·7892	2·393
51	74590	934	1·2528	79·808	97	328	161	49·1613	2·034
52	73656	963	1·3073	76·511	98	167	98	59·0648	1·693
53	72693	1006	1·3838	72.254	99	69	45	66·0370	1·514
54	71687	1063	1·4825	67·431	100	24	24	85·0000	1·176
55	70624	1132	1·6033	62·383					

Table M.—(*continued.*)

Towns.—Scotland.

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	275	·2750	363·636	56	67829	988	1·4568	68·634
11	99725	274	·2750	363·636	57	66841	1153	1·7247	57·971
12	99451	290	·2915	343·053	58	65688	1303	1·9838	50·403
13	99161	322	·3246	308 072	59	64385	1439	2·2342	44·763
14	98839	370	·3741	267·308	60	62946	1559	2·4759	40·388
15	98469	433	·4402	227·170	61	61387	1663	2 7088	36·914
16	98036	513	·5228	191·278	62	59724	1915	3·2056	31·192
17	97523	571	·5857	170 736	63	57809	2293	3·9664	25 214
18	96952	610	·6287	159 058	64	55516	2771	4·9911	20·036
19	96342	628	·6520	153·374	65	52745	3312	6·2797	15·924
20	95714	627	·6555	152·555	56	49433	3872	7·8323	12·768
21	95087	608	·6392	156·446	67	45561	3986	8·7480	11·431
22	94479	587	·6215	160·901	68	41575	3753	9·0267	11 078
23	93892	566	·6025	165·975	69	37822	3279	8·6686	11·535
24	93326	543	·5821	171·792	70	34543	2651	7·6735	13·031
25	92783	520	·5604	178·444	71	31892	1927	6·0416	16·551
26	92263	496	·5373	186·116	72	29965	1578	5 2649	18·993
27	91767	486	·5301	188·644	73	28387	1517	5·3435	18 713
28	91281	492	·5389	185·563	74	26870	1687	6·2774	15·931
29	90789	512	·5635	177·462	75	25183	2031	8·0666	12 396
30	90277	545	·6041	165·536	76	23152	2480	10 7110	9·337
31	89732	593	·6606	151·378	77	20672	2623	12·6885	7·880
32	89139	639	·7172	139·431	78	18049	2526	13·9967	7·143
33	88500	685	·7737	129·249	79	15523	2272	14·6378	6 831
34	87815	729	·8303	120·438	80	13251	1936	14·6112	6 845
35	87086	772	·8869	112·752	81	11315	1575	13 9168	7·184
36	86314	814	·9436	105·977	82	9740	1333	13·6887	7·305
37	85500	837	·9789	102·156	83	8407	1171	13·9270	7·179
38	84663	841	·9928	100·725	84	7236	1059	14·6315	6·835
39	83822	826	·9854	101·482	85	6177	976	15·8024	6·329
40	82996	794	·9567	104·526	86	5201	907	17 4396	5·734
41	82202	745	·9066	110·302	87	4294	827	19 2608	5·192
42	81457	749	·9192	108·790	88	3467	737	21 2660	4·701
43	80708	803	·9944	100·563	89	2730	635	23 2552	4 299
44	79905	905	1·1324	88·339	90	2095	537	25·6284	3·902
45	79000	1053	1·3330	75·019	91	1558	438	28·1856	3·547
46	77947	1244	1·5964	62·657	92	1120	344	30 7328	3·254
47	76703	1340	1·7472	57·241	93	776	258	33·2701	3·006
48	75363	1346	1·7855	55 991	94	518	186	35·9973	2·778
49	74017	1268	1·7133	58 377	95	332	128	38·5147	2·597
50	72749	1107	1·5246	65·574	96	204	83	41·0220	2·438
51	71642	878	1·2254	81·633	97	121	55	46·0819	2·170
52	70764	737	1·0414	96·061	98	66	35	53·3790	1·873
53	70027	681	·9725	102·828	99	31	19	61·3067	1·631
54	69346	707	1·0188	98·135	100	12	12	75·0000	1·331
55	68639	810	1·1802	84 746					

Table M.—(*continued.*)

Cities.—Scotland.

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	396	·3961	252·462	56	45206	1872	4·1399	24·155
11	99604	395	·3961	252·462	57	43334	1870	4·3159	23·170
12	99209	401	·4038	247·647	58	41464	1844	4·4460	22·492
13	98808	414	·4193	238·493	59	39620	1795	4·5302	22·075
14	98394	435	·4425	225·989	60	37825	1728	4·5684	21·891
15	97959	464	·4735	211·193	61	36097	1646	4·5608	21·925
16	97495	499	·5123	195·198	62	34451	1571	4·5608	21·925
17	96996	564	·5817	171·910	63	32880	1502	4·5687	21·887
18	96432	657	·6818	146·671	64	31378	1439	4·5843	21·815
19	95775	778	·8126	123·062	65	29939	1379	4·6076	21·701
20	94997	925	·9740	102·669	66	28560	1325	4·6387	21·556
21	94072	1097	1·1661	85·763	67	27235	1320	4·8448	20·640
22	92975	1213	1·3044	76·687	68	25915	1354	5·2258	19·135
23	91762	1275	1·3889	71·994	69	24561	1420	5·7818	17·295
24	90487	1285	1·4195	70·423	70	23141	1507	6·5128	15·354
25	89202	1246	1·3963	71·633	71	21634	1605	7·4188	13·479
26	87956	1160	1·3193	75·815	72	20029	1623	8·1009	12·344
27	86796	1103	1·2705	78·678	73	18406	1575	8·5591	11·684
28	85693	1071	1·2499	80·000	74	16831	1480	8·7933	11·373
29	84622	1064	1·2575	79·491	75	15351	1351	8·8037	11·358
30	83558	1081	1·2933	77·340	76	14000	1203	8·5902	11·641
31	82477	1119	1·3573	73·692	77	12797	1132	8·8429	11·308
32	81358	1156	1·4203	70·423	78	11665	1115	9·5617	10·458
33	80202	1189	1·4822	67·476	79	10550	1134	10·7467	9·302
34	79013	1219	1·5431	64·809	80	9416	1167	12·3979	8·065
35	77794	1247	1·6029	62·383	81	8249	1197	14·5152	6·887
36	76547	1272	1·6618	60·168	82	7052	1165	16·5179	6·053
37	75275	1293	1·7171	58·241	83	5887	1084	18·4060	5·432
38	73982	1309	1·7688	56·529	84	4803	969	20·1794	4·955
39	72673	1321	1·8170	55·036	85	3834	837	21·8382	4·579
40	71352	1328	1·8617	53·706	86	2997	701	23·3823	4·277
41	70024	1333	1·9029	52·549	87	2296	576	25·1048	3·984
42	68691	1358	1·9770	50·582	88	1720	465	27·0056	3·702
43	67333	1403	2·0841	47·985	89	1255	365	29·0849	3·439
44	65930	1466	2·2242	44·964	90	890	279	31·3425	3·191
45	64464	1545	2·3973	41·719	91	611	206	33·7784	2·960
46	62919	1638	2·6033	38·417	92	405	146	36·0226	2·776
47	61281	1708	2·7865	35·881	93	259	99	38·0750	2·626
48	59573	1756	2·9469	33·933	94	160	64	39·9357	2·504
49	57817	1783	3·0843	32·425	95	96	40	41·6047	2·404
50	56034	1793	3·1989	31·260	96	56	24	43·0820	2·321
51	54241	1785	3·2907	30·386	97	32	15	47·3179	2·113
52	52456	1788	3·4084	29·343	98	17	9	53·9970	1·852
53	50668	1800	3·5523	28 145	99	8	5	61·3067	1·631
54	48868	1819	3·7221	26·867	100	3	3	75·0000	1·333
55	47049	1843	3·9180	25·523					

Table M.—(*continued.*)

Rural, Town, and City Districts.—Scotland.

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	250	·2499	400·160	56	64211	1388	2·1615	46·253
11	99750	249	·2499	400·160	57	62823	1468	2·3360	42·808
12	99501	265	·2663	375·516	58	61355	1546	2·5189	39·698
13	99236	297	·2991	334·336	59	59809	1621	2·7101	36·900
14	98939	345	·3484	287·026	60	58188	1693	2·9096	34·364
15	98594	408	·4140	241·546	61	56495	1761	3·1175	32·072
16	98186	487	·4961	201·572	62	54734	1814	3·3149	30·166
17	97699	553	·5659	176·710	63	52920	1853	3·5019	28·555
18	97146	606	·6234	160·411	64	51067	1879	3·6786	27·181
19	96540	645	·6686	149·566	65	49188	1891	3·8448	26·008
20	95895	673	·7015	142·552	66	47297	1892	4·0007	24·994
21	95222	688	·7221	138·485	67	45405	1909	4·2036	23·787
22	94534	697	·7377	135·557	68	43496	1937	4·4538	22·452
23	93837	702	·7483	133·636	69	41559	1975	4·7511	21·048
24	93135	702	·7539	132·644	70	39584	2017	5·0955	19·623
25	92433	697	·7545	132·538	71	37567	2061	5·4871	18·225
26	91736	688	·7502	133·298	72	35506	2066	5·8183	17·188
27	91048	685	·7518	133·014	73	33440	2036	6·0892	16·423
28	90363	686	·7594	131·683	74	31404	1978	6·2997	15·873
29	89677	693	·7730	129·366	75	29426	1898	6·4499	15·504
30	88984	705	·7926	126·167	76	27528	1800	6·5397	15·291
31	88279	722	·8182	122·220	77	25728	1795	6·9783	14·331
32	87557	742	·8474	118·008	78	23933	1859	7·7657	12·877
33	86815	764	·8801	113·624	79	22074	1965	8·9019	11·233
34	86051	789	·9164	109·123	80	20109	2089	10·3868	9·625
35	85262	815	·9562	104·581	81	18020	2202	12·2205	8·183
36	84447	844	·9996	100·040	82	15818	2177	13·7630	7·267
37	83603	864	1·0334	96·805	83	13641	2048	15·0144	6·662
38	82739	875	1·0575	94·518	84	11593	1852	15·9747	6·262
39	81864	878	1·0719	93·284	85	9741	1621	16·6438	6·010
40	80986	872	1·0767	92·851	86	8120	1382	17·0217	5·875
41	80114	859	1·0719	93·284	87	6738	1199	17·7963	5·618
42	79255	861	1·0867	91·996	88	5539	1051	18·9674	5·271
43	78394	879	1·1212	89·206	89	4488	922	20·5351	4·869
44	77515	911	1·1754	85·106	90	3566	802	22·4994	4·444
45	76604	957	1·2492	80·064	91	2764	687	24·8602	4·023
46	75647	1016	1·3427	74·460	92	2077	569	27·4071	3·648
47	74631	1062	1·4229	70·274	93	1508	455	30·1400	3·318
48	73569	1096	1·4896	67·114	94	1053	348	33·0589	3 025
49	72473	1118	1·5430	64·809	95	705	255	36·1639	2·765
50	71355	1130	1·5830	63·171	96	450	178	39·4548	2·535
51	70225	1130	1·6096	62·112	97	272	123	45·1416	2·215
52	69095	1150	1·6641	60·096	98	149	79	52·9088	1·890
53	67945	1187	1·7466	57·241	99	70	43	61·3067	1·631
54	66758	1240	1·8569	53·850	100	27	27	75·0000	1 333
55	65518	1307	1·9952	50·125					

Table N.

Expectation.—Scotland.

Age.	Rural Districts.	Town Districts.	City Districts.	Rural, Town, & City Districts	Age.	Rural Districts.	Town Districts.	City Districts.	Rural, Town, & City Districts
10	53·0510	50·7434	42·6373	50.8034	56	18·6111	16·0438	14·8280	17 8953
11	52·1722	49·8830	41·8048	49·9295	57	17·9331	15·2735	14·4469	17·2797
12	51·2911	49·0180	40·9694	49·0532	58	17·2733	14·5329	14·0759	16·6812
13	50·4169	48·1599	40 1335	48·1828	59	16·6343	13·8168	13·7077	16·0994
14	49·5580	47·3152	39·3002	47·3260	60	16·0180	13·1213	13·3345	15·5340
15	48·7221	46·4911	38·4725	46·4898	61	15·4267	12·4418	12·9490	14·9845
16	47·9173	45·6942	37·6533	45·6810	62	14·8617	11·7743	12·5437	14·4506
17	47·1508	44·9319	36·8444	44·9062	63	14·3163	11·1478	12·1192	13·9288
18	46·4129	44·1936	36 0570	44·1590	64	13·7839	10·5876	11·6753	13·4160
19	45·6955	43·4703	35·3008	43·4330	65	13·2588	10·1175	11·2125	12·9094
20	44·9901	42 7522	34·5860	42·7218	66	12·7351	9·7619	10·7297	12·4056
21	44·2886	42·0308	33 9211	42·0201	67	12·2073	9 5491	10·2274	11·9017
22	43·5830	41·2981	33·3154	41·3224	68	11·6808	9·4166	9·7229	11·4021
23	42·8736	40·5531	32·7492	40·6255	69	11·1607	9·3014	9·2314	10·9102
24	42·1600	39·7960	32·2036	39·9280	70	10·6514	9·1369	8·7671	10 4296
25	41·4422	39·0260	31·6603	39·2274	71	10·1578	8·8548	8·3430	9·9627
26	40·7201	38·2432	31·1018	38·5217	72	9·6808	8·3921	7·9715	9·5118
27	39·9931	37·4472	30·5107	37·8090	73	9·2107	7·8308	7·6303	9·0688
28	39·2613	36·6439	29·8970	37·0919	74	8·7374	7·2447	7·2975	8·6243
29	38·5247	35 8398	29·2690	36·3717	75	8·2513	6·6965	6·9529	8·1705
30	37·7826	35·0397	28·6354	35·6512	76	7·7431	6·2401	6·5756	7·6993
31	37·0347	34·250)	28·0042	34·9319	77	7·2039	5·9287	6·1467	7·2030
32	36·2809	33 4745	27·3824	34·2157	78	6·6622	5·7177	5·6947	6·7057
33	35·5241	32·7126	26·7700	33·5040	79	6·1411	5·5667	5·2437	6·2284
34	34·7671	31·9639	26·1653	32·7969	80	5·6598	5·4355	4·8150	5·7882
35	34·0125	31·2272	25·5674	32·0958	81	5·2350	5·2799	4·4254	5·4012
36	33·2626	30·5021	24·9755	31·4008	82	4·8828	5·0529	4·0917	5·0835
37	32·5199	29·7877	24·3893	30·7127	83	4·5880	4·7748	3·8025	4·8149
38	31·7814	29·0772	23·8069	30·0282	84	4·3384	4·4666	3·5479	4·5772
39	31·0442	28·3640	23·2267	29·3438	85	4·1237	4·1466	3·3182	4·3524
40	30·3052	27·6413	22·6474	28·6565	86	3·9341	3·8309	3·1053	4·1214
41	29·5621	26·9034	22·0675	27·9630	87	3·7600	3·5345	2·9007	3·8642
42	28·8126	26·1449	21·4860	27·2606	88	3·5923	3·2583	2·7047	3·5925
43	28·0598	25·3829	20 8624	26·5545	89	3·4192	3·0029	2·5215	3·3166
44	27·3070	24·6330	20·3436	25·8501	90	3·2280	2·7616	2·3506	3·0449
45	26·5571	23·9095	19·7948	25·1515	91	3·0033	2·5411	2·1956	2·7833
46	25·8129	23·2257	19·2686	24·4633	92	2·7243	2·3393	2·0580	2·5385
47	25·0769	22·5943	18·7703	23·7895	93	2·4210	2·1546	1·9363	2·3077
48	24·3472	21·9871	18·2941	23·1251	94	2·1181	1·9788	1·8250	2·0888
49	23·6215	21·3778	17·8345	22·4679	95	1·8181	1·8072	1·7084	1·8730
50	22·8980	20·7418	17·3861	21·8122	96	1·5426	1·6275	1·5714	1·6511
51	22·1748	20·0545	16·9443	21·1550	97	1·2926	1·4008	1·3750	1·4044
52	21·4497	19·2971	16·5039	20·4930	98	1·0568	1·1515	1·1471	1·1510
53	20·7272	18·4949	16·0 87	19·8312	99	·8478	·8871	·8750	·8857
54	20·0111	17·6717	15·6421	19·1750	100	·5000	·5000	·5000	·5000
55	19·3048	16·8486	15·2275	18·5285					

From a consideration of these results, it will be seen that the Rural Districts of the two countries have shewn the nearest approximation; and this is precisely what might have been anticipated from a careful consideration of the elements entering into the formation of the respective Tables. In the Rural Districts of all countries, the condition of the population, as to occupation and employment, is more nearly the same than in the Town or City Districts; and since employment has been shewn to have so important an effect on the Duration of Life, the rates of mortality should differ less in the Rural Districts, where less diversity of employment exists. Before, however, fixing definitely on the Scotch Cities so high a rate of mortality as that shewn in Table M, it should be kept in view that one very important element of the investigation has not yet been touched upon. In considering the condition of the English Cities, it was shewn how an accidental combination of certain trades would produce a very different result from the fair average of the general population; so also, in the present comparison of the Scotch with the English Cities, may an excess of particular trades, not common to both Districts, or not existing in both Districts in the same ratio, modify the results. The inquiry will therefore not be complete till similar trades in both Districts be compared. To enter further, however, into that question would, as already stated, be to go beyond the limits assigned to this paper.

But as some curiosity may naturally be excited by the marked difference in the value of life, as shewn in the preceding Table, between the Scotch and English Cities, it has been thought of sufficient importance to form Mortality Tables for the general population of the City of Glasgow, in order to compare the results with English Cities.

These Tables—viz. O, P, Q, and R—have been formed exactly in the same manner as Tables A, B, C, D. It is therefore not necessary to enter further into that part of the question, than to state that the basis of the Tables are the Mortality Bills for the City of Glasgow for the ten years 1832-1841, and the population as enumerated in 1831 and 1841.

An inspection of Table Q will shew that of the male population of Glasgow alive at Age 10, one half is cut off between the ages 48-9, which is

20 years earlier than among Friendly Societies in the Rural Districts of England.
19 ... ... Scotland.
17 ... ... Town ... ...
16 ... ... England.
13 ... ... City ... ...
5 ... ... Scotland.
3 ... ... Clerks, which was the worst class of results formerly arrived at.

If the nature of this paper permitted a more extended review of all the facts presented [many

Table O.

Population of Glasgow for 1831 and 1841; with the Annual Rate of Increase during the intermediate period.

Age.	MALES.			FEMALES.			Age.
	Population 1831.	Population 1841.	Annual Rate of Increase.	Population 1831.	Population 1841.	Annual Rate of Increase.	
Under 5	15422	17840	1·01467	14855	17544	1·01677	Under 5
5 ... 10	13127	14552	1·01035	12580	14837	1·01664	5 ... 10
10 ... 15	10491	14252	1·03111	10720	14541	1·03092	10 ... 15
15 ... 20	8489	13677	1·04882	12256	16931	1·03281	15 ... 20
20 ... 30	15177	28304	1·06430	23008	32778	1·03602	20 ... 30
30 ... 40	12179	18890	1·04487	14240	20706	1·03814	30 ... 40
40 ... 50	8685	12047	1·03326	9329	12804	1·03220	40 ... 50
50 ... 60	5549	5991	1·00771	6099	7034	1·01436	50 ... 60
60 ... 70	3228	3364	1·00413	3692	4462	1·01911	60 ... 70
70 ... 80	1090	1282	1·01630	1502	1720	1·01365	70 ... 80
80 ... 90	260	256	—1·00140	385	447	1·01517	80 ... 90
90 ...100	26	22	—1·01670	32	41	1·02527	90 ...100
100 and upwards.	1	1	1·00000	4	1	—1·14855	100 and upwards.
Total	93724	130478	1·03364	108702	143846	1·02641	Total.

Table P.

Glasgow—Total of the Population as calculated for the 30th of June in each of the Years 1832-1841, inclusive; with the Sum of the Deaths for the corresponding years, as given in the Mortality Bills; and the Mortality per Cent. during the same period.

Age.	MALES.			FEMALES.			Age.
	Population.	Deaths.	Mortality per Cent.	Population.	Deaths.	Mortality per Cent.	
Under 5	167389	18846	10·6613	163155	16304	9·9929	Under 5
5 ... 10	139087	2331	1·6759	138056	2134	1·5457	5 ... 10
10 ... 15	127201	989	·7775	127512	973	·7630	10 ... 15
15 ... 20	111753	1209	1·0818	147340	1147	·7777	15 ... 20
20 ... 30	218158	3211	1·4718	281626	3292	1·1689	20 ... 30
30 ... 40	156737	3336	2·1284	176405	3228	1·8300	30 ... 40
40 ... 50	104660	3276	3·1301	111731	3001	2·6859	40 ... 50
50 ... 60	57928	2552	4·4054	66086	2628	3·9766	50 ... 60
60 ... 70	33033	2564	7·7619	41084	2651	6·4526	60 ... 70
70 ... 80	11942	1956	16·3791	16212	2244	13·8416	70 ... 80
80 ... 90	2580	780	30·2325	4190	1012	24·1527	80 ... 90
90 ...100	238	92	38·6554	368	155	42·1196	90 ...100
100 and upwards.	10	9	90·0000	19	15	78·9476	100 and upwards.
Total	1130716	41151	3·6393	1273784	38784	3·0447	Total.

Table Q.

Glasgow.—*Males.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	1316	1 3157	75·988	56	36836	1669	4·5303	22·075
11	98684	1121	1·1360	88·028	57	35167	1682	4·7827	20·907
12	97563	980	1·0047	99·502	58	33485	1700	5·0768	19·697
13	96583	890	·9214	108·531	59	31785	1720	5·4125	18·474
14	95693	848	·8863	112·829	60	30065	1728	5·7482	17·397
15	94845	853	·8993	111·198	61	28337	1724	6·0838	16·437
16	93992	902	·9601	104·156	62	26613	1708	6·4195	15·576
17	93090	948	1·0186	98·135	63	24905	1682	6·7551	14·804
18	92142	990	1·0746	93·023	64	23223	1647	7·0907	14·102
19	91152	1028	1·1282	88·652	65	21576	1625	7·5315	13·277
20	90124	1063	1·1794	84·818	66	19951	1612	8·0776	12·379
21	89061	1094	1·2282	81·433	67	18339	1601	8·7289	11·456
22	87967	1123	1·2769	78·309	68	16738	1588	9·4854	10·543
23	86844	1151	1·3257	75·415	69	18150	1568	10·3472	9·662
24	85693	1178	1·3744	72·780	70	13582	1522	11·2089	8·921
25	84515	1206	1·4265	70·077	71	12060	1458	12·0906	8·271
26	83309	1235	1·4820	67·476	72	10602	1375	12·9723	7·710
27	82074	1265	1·5411	64·893	73	9227	1280	13·8740	7·210
28	80809	1296	1·6036	62·344	74	7947	1171	14·7397	6·784
29	79513	1328	1·6695	59·880	75	6776	1064	15·7061	6·365
30	78185	1357	1·7354	57·637	76	5712	957	16·7573	5·967
31	76828	1384	1·8013	55·525	77	4755	852	17·9132	5·580
32	75444	1409	1·8669	53·562	78	3903	748	19·1539	5·222
33	74035	1431	1·9328	51·733	79	3155	648	20·5353	4·869
34	72604	1451	1·9982	50·050	80	2507	550	21·9206	4·562
35	71153	1473	2·0694	48·333	81	1957	456	23·3060	4·290
36	69680	1496	2·1465	46 577	82	1501	371	24·6913	4·050
37	68184	1520	2·2294	44·863	83	1130	295	26·0766	3·834
38	66664	1545	2·3180	43·141	84	835	229	27·4619	3·642
39	65119	1571	2·4128	41·442	85	606	174	28·7386	3 479
40	63548	1594	2·5076	39·872	86	432	129	29·9067	3·343
41	61954	1612	2·6024	38·432	87	303	94	30·9662	3·229
42	60342	1628	2·6972	37·078	88	209	67	31·9770	3·127
43	58714	1639	2·7919	35·817	89	142	47	32·7593	3·053
44	57075	1654	2 8975	34·507	90	95	32	33·6016	2·976
45	55421	1668	3·0096	33·223	91	63	21	34·4439	2·904
46	53753	1682	3·1282	31·969	92	42	14	35·2862	2·834
47	52071	1694	3·2535	30·731	93	28	10	36·1285	2·768
48	50377	1706	3·3853	29·542	94	18	6	36·9708	2·705
49	48671	1710	3·5128	28·466	95	12	4	38·6715	2·586
50	46961	1710	3·6404	27·473	96	8	3	41·2307	2 425
51	45251	1705	3 7679	26·539	97	5	2	44·6483	2·240
52	43546	1696	4·8954	25 674	98	3	1	48·9244	2·044
53	41850	1684	4·0229	24·857	99	2	1	54·0589	1·850
54	40166	1667	4·1504	24·096	100	1	1	59·1934	1·689
55	38499	1663	4.3195	23·148					

Table Q.—(*continued.*)

Glasgow.—*Females.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	1433	1·4327	69·784	56	42123	1705	4·0478	24·704
11	98567	1258	1·2761	78·370	57	40418	1717	4·2479	23·540
12	97309	1121	1·1515	86·806	58	38701	1731	4·4718	22·361
13	96188	1018	1·0588	94·429	59	36970	1745	4·7194	21·191
14	95170	950	·9979	100·210	60	35225	1750	4·9670	20·133
15	94220	724	·7687	130·090	61	33475	1746	5·2146	19·175
16	93496	722	·7717	129·584	62	31729	1733	5·4622	18·308
17	92774	727	·7838	127·584	63	29996	1713	5·7098	17·513
18	92047	741	·8051	124·208	64	28283	1685	5·9574	16·787
19	91306	763	·8356	119·675	65	26598	1677	6·3033	15·865
20	90543	793	·8755	114·220	66	24921	1682	6·7474	14·821
21	89750	830	·9244	108·178	67	23239	1694	7·2898	13·717
22	88920	865	·9733	102·743	68	21545	1704	7·9104	12·642
23	88055	900	1·0222	97·847	69	19841	1716	8·6493	11·562
24	87155	934	1·0711	93 371	70	18125	1702	9·3882	10·652
25	86221	969	1·1235	88·968	71	16423	1663	10·1271	9·872
26	85252	1005	1·1793	84·818	72	14760	1604	10·8660	9·200
27	84247	1043	1·2385	80·710	73	13156	1529	11·6249	8·606
28	83204	1083	1·3012	76·864	74	11627	1438	12·3638	8·091
29	82121	1123	1·3673	73·153	75	10189	1341	13·1612	7·599
30	80998	1161	1·4334	69·784	76	8848	1240	14·0170	7·133
31	79837	1197	1·4995	66·667	77	7608	1136	14·9312	6·698
32	78640	1231	1·5654	63·898	78	6472	1029	15·9039	6·289
33	77409	1263	1·6315	61·275	79	5443	922	16·9350	5·907
34	76146	1293	1·6976	58·893	80	4521	812	17·9661	5·565
35	74853	1323	1·7676	56·561	81	3709	705	18·9972	5·263
36	73530	1354	1·8415	54·289	82	3004	602	20·0283	4·993
37	72176	1386	1·9195	52·083	83	2402	506	21·0594	4·748
38	70790	1417	2·0012	49·975	84	1896	419	22·0905	4·527
39	69373	1448	2·0868	47·916	85	1477	344	23·2747	4·297
40	67925	1476	2·1724	46·041	86	1133	279	24·6121	4·063
41	66449	1500	2·2580	44·287	87	854	223	26·1025	3·831
42	64949	1522	2·3436	42·662	88	631	175	27·7461	3·604
43	63427	1541	2·4292	41·169	89	456	135	29·5428	3·385
44	61886	1556	2·5148	39·761	90	321	101	31·3395	3·191
45	60330	1574	2·6091	38·329	91	220	73	33·1362	3·018
46	58756	1594	2·7120	36·873	92	147	51	34·9329	2·863
47	57162	1614	2·8237	35·411	93	96	35	36·7296	2·723
48	55548	1635	2·9441	33·967	94	61	24	38·5263	2·595
49	53913	1657	3·0732	32·541	95	37	15	40·7002	2·457
50	52256	1673	3·2023	31·230	96	22	9	43·2513	2·312
51	50583	1685	3·3314	30·021	97	13	6	46·1796	2·165
52	48898	1692	3·4605	28·893	98	7	4	49·4852	2·020
53	47206	1695	3·5895	27·855	99	3	2	53·1680	1·881
54	45511	1692	3·7186	26·889	100	1	1	56·8508	1·759
55	43819	1696	3·8709	25·833					

many remarkable coincidences would be seen to have taken place, and one among these must be already obvious. The general results for Friendly Societies in England and Wales were found to be more favourable to life than the results for the whole population of England and Wales, and that in both sexes; so, also, were the results for the Members of Friendly Societies in Liverpool more favourable than those for the whole population of Liverpool; and here it will likewise be seen that the mortality of the general population of Glasgow is greater than among the Members of Friendly Societies in the City Districts of Scotland.

The difference between the Equation for Age 10 in Male and Female Life for the whole population of Glasgow is 3·125 years, while in the general population of England and Wales it is a little above one year. This suggests the mention of another feature which presents itself in this enquiry. It appears that the higher the absolute value of Life in any class of results, the less distinction will there be found between Male and Female Life. Thus—

Equation of Life for Age 10.

Friendly Societies in England and Wales	Females = 56·749	
	Males = 56·408	
	——— diff. = ·341 of a year	
Total Population of England and Wales	Females = 53·554	
	Males = 52·308	
	——— diff. = 1·249	...
Whole Population of Glasgow .	Females = 41·346	
	Males = 38·221	
	——— diff. = 3·125	...

If comparisons were made between the sexes in the intermediate classes of results, a development of the same feature would be seen. As has already been stated, where the Duration of Life is reduced below its average standard by the prevalence of unhealthy occupations, the influence will be more strongly felt in the male than in the female sex.

If the expectation of Life for the City of Glasgow, as given in Table R, be now referred to, the remarkable depreciation in the duration of life there will appear somewhat startling. No Table of Mortality hitherto published has shewn any thing like so low an estimate. Liverpool has been frequently referred to as an example of the short Duration of Life; but a comparison of the Expectation of Male Life for Liverpool, as given at page 59, with the results in Table R, will shew

At Age 30	a higher value by	3·101 years
40	...	2·548
50	...	1·535

[The mortality

Table R.

Expectation.

Age.	Glasgow, whole Population.		Dundee, whole Population.		Age.	Glasgow, whole Population.		Dundee, whole Population.	
	Males.	Females.	Males.	Females.		Males.	Females.	Males.	Females.
10	37·3954	39·9471	43·2973	45·8731	56	11·7116	12·9541	13·8635	15·1653
11	36·8874	39·4286	42·6385	45·2353	57	11·2426	12·4794	13·3322	14·6185
12	36·4055	38·9319	41·9362	44·5587	58	10·7822	12·0109	12·8117	14·0791
13	35·6688	38·3797	41·2102	43·8632	59	10·3322	11·5499	12·3050	13·5480
14	34·9959	37·7849	40·4621	43·1501	60	9·8946	11·0973	11·8155	13·0262
15	34·3043	37·1609	39·7027	42·4173	61	9·4675	10·6513	11·3407	12·5117
16	33·6111	36·4448	38·9405	41·6723	62	9·0485	10·2099	10·8784	12·0027
17	32·9317	35·7245	38·1824	40·9205	63	8·6347	9·7709	10·4266	11·4975
18	32·2656	35·0027	37·4327	40·1647	64	8·2239	9·3324	9·9832	10·9941
19	31·6106	34·2827	36·6930	39·4058	65	7·8135	8·8919	9·5459	10·4907
20	30·9655	33·5674	35·9632	38·6541	66	7·4092	8·4564	9·1174	9·9934
21	30·3291	32·8596	35·2426	37·9096	67	7·0165	8·0322	8·6999	9·5083
22	29·7000	32·1616	34·5307	37·1716	68	6·6398	7·6248	8·2956	9·0400
23	29·0776	31·4726	33·8269	36·4398	69	6·2834	7·2367	7·9057	8·5932
24	28·4615	30·7228	33·1311	35·7138	70	5·9510	6·8745	7·5320	8·1719
25	27·8512	30·1206	32·4423	34·9934	71	5·6390	6·5351	7·1718	7·7724
26	27·2472	29·4573	31·7601	34·2779	72	5·3457	6·2150	6·8216	7 3916
27	26·6496	28·8027	31·0839	33·5677	73	5·0678	5·9118	6·4787	7·0261
28	26·0590	28·1575	30·8133	32·8626	74	4·8035	5·6235	6·1524	6·6730
29	25·4756	27·5223	29·7478	32·1624	75	4·5472	5·3466	5·8006	6·3288
30	24·8998	26·8970	29·0866	31·4666	76	4·3011	5·0812	5·4679	5·9961
31	24·3308	26·2808	28·4291	30·7754	77	4·0661	4·8278	5·1470	5·6777
32	23·7679	25·6732	27·7754	30·0879	78	3·8446	4·5875	4·8427	5·3757
33	23·2108	25·0735	27·1245	29·4037	79	3·6376	4·3602	4·5591	5·0924
34	22·6584	24·4811	26·4761	28·7225	80	3·4485	4·1474	4·3012	4·8305
35	22·1102	23·8953	25·8297	28·0439	81	3·2772	3·9457	4·0706	4·5872
36	21·5670	23·3163	25·1877	27·3688	82	3·1209	3·7547	3·8569	4·3604
37	21·0293	22·7443	24·5520	26·6987	83	2·9814	3·5703	3·6629	4·1473
38	20·4974	22·1798	23·9248	26·0344	84	2·8581	3 3898	3·4867	3 9456
39	19·9718	21·6227	23·3075	25·3768	85	2·7491	3·2096	3·3272	3·7536
40	19·4532	21·0730	22·7017	24·7270	86	2·6551	3·0322	3·1813	3·5712
41	18·9409	20·5300	22·1068	24·0840	87	2·5726	2·8595	3·0488	3·3975
42	18·4335	19·9925	21·5218	23·4473	88	2·5047	2·6933	2 9260	3·2323
43	17·9307	19·4603	20·9457	22·8162	89	2·4507	2·5351	2·8109	3·0758
44	17·4313	18·9324	20·3775	22·1896	90	2 4158	2·3910	2·7034	2 9282
45	16·9366	18·4079	19·8168	21·5671	91	2 3889	2·2591	2 5997	2·7854
46	16·4466	17·8875	19·2620	20·9498	92	2·3333	2·1327	2·5075	2·6492
47	15·9618	17·3724	18·7129	20·3391	93	2·2500	2·0000	2 4022	2·5119
48	15·4817	16·8626	18·1679	19·7356	94	2·2223	1·8606	2·3000	2·3712
49	15·0061	16·3589	17·6266	19·2264	95	2·0761	1·7432	2·1786	2·2192
50	14·5350	15·8617	17·0891	18·5541	96	1·8750	1·5909	2 0179	2·0474
51	14·0654	15·3698	16·5521	17·9757	97	1·7000	1·3461	1·7973	1·8297
52	13·5965	14·8822	16·0160	17·4041	98	1·5000	1·0714	1·5000	1·5508
53	13·1273	14·3977	15·4795	16·8381	99	1·0000	·8333	1·0000	1·1315
54	12·6567	13·9153	14·9417	16·2766	100	·5000	·5000	·5000	·5000
55	12·1831	13·4333	14·4014	15·7186					

The mortality of a population like that of Glasgow is subject to remarkable fluctuations, shewing an extreme difference in some years of about 68 per cent., or a mean fluctuation of about 32 per cent. An inspection of the total male deaths for all ages, for each of the ten years 1832—1842, will render this evident.

Total Deaths in 1832	4811	Total Deaths in 1837	5423
... 1833	3229	... 1838	3490
... 1834	3255	... 1839	3898
... 1835	3726	... 1840	4470
... 1836	4334	... 1841	4514

It will further be seen that those remarkable fluctuations are due chiefly to the mortality in mature life, and not to the mortality in infancy, as some writers have believed.

Year.	From Age 20 to 50.	In the First Year of Life.	Year.	From Age 20 to 50.	In the First Year of Life.
In 1832	1795	332	In 1837	1991	371
1833	902	306	1838	1010	336
1834	923	313	1839	966	318
1835	885	365	1840	1346	404
1836	1279	115	1841	1278	381

The preceding will shew, that while the extreme difference in the mortality from ages 20 to 50 is 125 per cent., for the first year of life it is only 32 per cent. If the mean fluctuation for ages 20 to 50 be taken, it will be found to be 53 per cent., while that for the first year of life is only 14 per cent. Were the inspection extended to the mortality of female life, similar results would be obtained. Notwithstanding the inferior numbers in infant life, the fluctuation is confined within narrower limits than the mortality of mature life; and this law is in obedience to the doctrine of probability, when applied to any other subject, as well as to the mortality of life. For whenever the intensity which determines any result increases—or in other words, when the probability of any event approaches unity—so also will the fluctuation in a series of events be reduced in amount.

It is evident from the preceding results of the Mortality in Glasgow, that a Table of the Expectation of Life calculated for one period of years—for example, the three years 1833, 1834, 1835—would differ widely from a Table founded on the results of the succeeding period of three years, and that the next succeeding period of three years would also differ in a marked degree from either of these: it has on that account been thought the better course to embrace the results of the whole ten years. On a previous occasion, a Table of the Expectation of Life for the five years, 1836—1840, had been calculated; and the results were for ages

$$20 = 27{\cdot}624 \qquad 40 = 21{\cdot}711 \qquad 50 = 16{\cdot}590$$

bringing the Expectation of Life above that given for the whole population of Liverpool,

in the Fifth Report of the Registrar General. It would therefore be rash to conclude that the public health of Glasgow is inferior to that of Liverpool; for if the same means existed of calculating the mortality of Liverpool during the ten years to which the results for Glasgow relate, it might then be found that the Expectation of Life, on an average of that number of years, was overstated by the Registrar General, whose figures were derived from the mortality of one year only.

In the Tenth Report of the Registrar General he has given the mortality of Liverpool for the seven years 1838-44, and the results will be found to fully bear out the views originally entertained in the preparation of this paper, as is evident from the facts contained in the following abstract, shewing the mortality per cent. in Liverpool, deduced from the Deaths for 1841, and also from the Deaths for the seven years 1838–44.

Age.	Mortality per Cent.		Age.
	Males.		
	1841.	1838-44.	
10 to 14	·654	·631	10 to 14
15 ... 24	·935	·987	15 ... 24
25 ... 34	1·239	1·268	25 ... 34
35 ... 44	2·215	2·162	35 ... 44
45 ... 54	3·261	3·367	45 ... 54
55 ... 64	5·298	5·305	55 ... 64
65 ... 74	9·644	10·634	65 ... 74
75 ... 84	17·422	20·740	75 ... 84
85 ... 94	19·713	32·230	85 ... 94

It is hence very desirable that our national records should be immediately made available to every inquirer into Vital Statistics, that the incorrect conclusions heretofore so generally drawn from limited observations, even under official sanction, may be supplanted by others founded on an enlarged and more carefully collected body of facts.

An inspection of Table R will shew that Female Life in Glasgow, as elsewhere, is of higher value than Male Life.

	At Age 30.	At Age 40.	At Age 50.
The Expectation of Females is	26·8970	21·0730	15·8617
And of Males . . .	24·8998	19·4532	14·5350
Difference	1·9972	1·6198	1·3267

Table S.

Dundee.—Total of the Populations as calculated for the 30th of June in each of the Years 1835–44 inclusive; with the sum of the Deaths for the Corresponding Years as given in the Mortality Bills, and the Mortality per Cent. during the same period.

Age.	MALES.			FEMALES.			Age.
	Population.	Deaths exclusive of Stillborn.	Mortality.	Population.	Deaths exclusive of Stillborn.	Mortality.	
Under 5	41450	3328	8·0289	41513	3042	7·3302	Under 5
5 ... 10	34005	413	1·2145	32622	410	1·2568	5 ... 10
10 ... 20	60931	377	·6187	67367	366	·5432	10 ... 20
20 ... 30	46877	481	1·0260	67086	569	·8481	20 ... 30
30 ... 40	39488	562	1·4232	46323	553	1·1950	30 ... 40
40 ... 50	24931	585	2·3464	31782	585	1·8406	40 ... 50
50 ... 60	14826	485	3·2712	18089	533	2 9465	50 ... 60
60 ... 70	8537	528	6·1848	12888	633	4·9116	60 ... 70
70 ... 80	4113	476	11·5730	5128	552	10·7644	70 ... 80
80 ... 90	831	204	24·5500	1197	252	21·0526	80 ... 90
90 ... 100	67	13	19·4030	155	34	21·9289	90 ... 100
100 and upwards.	0	2	0	19	2	10·5263	100 and upwards.
	276056	7454	2·7000	324129	7531	2·3234	

The preceding results seem to point out a higher rate of mortality as pervading all the groups of observations brought into comparison from Scotland; and it is therefore to be regretted that the Registration Act does not extend to that country, and afford a certain means of solving so important a question. The subject, however, in its present state, has been thought of sufficient importance to warrant the calculation of Mortality Tables for the Town of Dundee; and accordingly Tables S and T have been deduced from the Mortality Bills of that Town for the ten years 1835–44, and the Census of the Population in 1841, on the principles described for the formation of Tables B and C. The Expectation of Life, as resulting from these Tables, will be found in Table R.

An inspection of Table T will shew that in Dundee the Equation of Male Life for Age 10 takes place at Age 55–6, which is seven years beyond the results obtained in Table Q for the whole population of Glasgow, and even two years higher than the

[Equation of

Table T.

Trades not Classified—Dundee—*Males.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	791	·7910	126·422	56	49251	1669	3·3905	29·490
11	99209	696	·7020	142·450	57	47582	1714	3·6023	27·762
12	98513	647	·6568	152·253	58	45868	1767	3·8538	25·947
13	97866	602	·6148	162·655	59	44101	1828	4·1451	24·125
14	97264	582	·5981	167·196	60	42273	1875	4·4365	22·538
15	96682	583	·6034	165·728	61	40398	1909	4·7278	21·151
16	96099	601	·6259	159·770	62	38489	1931	5·0192	19·924
17	95498	630	·6601	151·492	63	36558	1941	5·3106	18·829
18	94868	664	·7003	142·796	64	34617	1939	5·6020	17·851
19	94204	698	·7410	134·953	65	32678	1942	5·9429	16·827
20	93506	731	·7818	127·910	66	30736	1946	6·3332	15·790
21	92775	763	·8225	121·581	67	28790	1950	6·7731	14·765
22	92012	791	·8632	115·848	68	26840	1948	7·2604	13·774
23	91218	825	·9039	110·632	69	24892	1941	7·8012	12·819
24	90393	854	·9446	105·865	70	22951	1914	8·3400	11·990
25	89539	882	·9851	101·513	71	21037	1867	8·8788	11·263
26	88657	909	1·0255	97·466	72	19170	1805	9·4176	10·618
27	87748	935	1·0656	93·809	73	17365	1728	9·9564	10·044
28	86813	960	1·1055	90·416	74	15637	1641	10·4953	9·524
29	85853	983	1·1453	87·336	75	13996	1565	11·1859	8·937
30	84870	1005	1·1850	84·388	76	12431	1495	12·0233	8·313
31	83865	1027	1·2247	81·633	77	10936	1424	13·0225	7·680
32	82838	1047	1·2644	79·114	78	9512	1347	14·1684	7·057
33	81791	1066	1·3041	76·687	79	8165	1262	15·4661	6·464
34	80725	1084	1·3438	74·405	80	6903	1162	16·7638	5·967
35	79641	1110	1·3940	71·736	81	5741	1036	18·0615	5·537
36	78531	1142	1·4548	68·729	82	4705	911	19·3592	5·165
37	77389	1181	1·5261	65·531	83	3794	784	20·6569	4·840
38	76208	1225	1·6080	62·189	84	3010	661	21·9546	4·556
39	74983	1274	1·7003	58·824	85	2349	545	23·2132	4·308
40	73709	1321	1·7927	55·772	86	1804	441	24·4327	4·093
41	72388	1364	1·8850	53·050	87	1363	349	25·6131	3·905
42	71024	1401	1·9774	50·582	88	1014	271	26·7544	3·738
43	69620	1440	2·0697	48·309	89	743	207	27·8566	3·589
44	68180	1474	2·1619	46·253	90	536	155	28·9588	3·453
45	66706	1503	2·2542	44·366	91	381	115	30·0610	3·327
46	65203	1530	2·3465	43·608	92	266	82	31·1632	3·209
47	63673	1552	2·4388	41·000	93	184	59	32·2654	3·099
48	62121	1572	2·5313	39·510	94	125	41	33·3676	2·997
49	60549	1592	2·6237	38·110	95	84	28	34·4638	2·902
50	58957	1601	2·7162	36·819	96	56	19	35·5071	2·816
51	57356	1611	2·8087	35·600	97	37	13	36·4348	2·745
52	55745	1617	2·9012	34·471	98	24	8	37·2708	2·683
53	54128	1620	2·9937	33·400	99	16	8	38·0060	2·631
54	52508	1620	3·0860	32·404	100	8	8	38·6500	2·587
55	50888	1637	3·2184	31·075					

TABLE T.—*(continued.)*

DUNDEE.—*Females.*

Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.	Age.	Living.	Dying.	Mortality per Cent.	Specific Intensity.
10	100000	792	·7920	126·263	56	54982	1648	2·9980	33·356
11	99208	712	·7180	139·276	57	53334	1685	3·1602	31·646
12	98496	676	·6864	145·688	58	51649	1724	3·3395	29·940
13	97820	643	·6578	152·022	59	49925	1765	3·5360	28·281
14	97177	605	·6228	160·565	60	48160	1797	3·7325	26·788
15	96572	584	·6050	165·289	61	46363	1821	3·9290	25·452
16	95988	575	·5994	166·834	62	44542	1837	4·1255	24·237
17	95413	573	·6010	166·389	63	42705	1845	4·3220	23·137
18	94840	573	·6042	165·508	64	40860	1846	4·5185	22·129
19	94267	598	·6347	157·555	65	39014	1869	4·7928	20·864
20	93669	623	·6652	150·331	66	37145	1911	5·1446	19·436
21	93046	647	·6957	143·740	67	35234	1964	5·5763	17·934
22	92399	671	·7262	137·703	68	33270	2024	6·0859	16·431
23	91728	694	·7567	132·153	69	31246	2085	6·6731	14·986
24	91034	717	·7872	127·033	70	29161	2117	7·2604	13·774
25	90317	739	·8185	122·175	71	27044	2122	7·8479	12·742
26	89578	762	·8506	117·564	72	24922	2101	8·4332	11·858
27	88816	785	·8836	113·173	73	22821	2058	9·0205	11·085
28	88031	808	·9174	109·004	74	20763	1994	9·6038	10·412
29	87223	830	·9521	105·031	75	18769	1928	10·2758	9·728
30	86393	853	·9868	101·338	76	16841	1858	11·0365	9·058
31	85540	874	1·0215	97·847	77	14983	1780	11·8859	8·410
32	84666	894	1·0562	94·697	78	13203	1692	12·8220	7·800
33	83772	914	1·0909	91·659	79	11511	1594	13·8508	7·220
34	82858	933	1·1256	88·810	80	9917	1475	14·8796	6·720
35	81925	955	1·1663	85·763	81	8442	1343	15·9084	6·285
36	80970	982	1·2129	82·440	82	7099	1202	16·9372	5·903
37	75988	1012	1·2655	78·989	83	5897	1059	17·9660	5·565
38	78976	1045	1·3240	75·929	84	4838	919	18·9949	5·266
39	77931	1082	1·3886	71·994	85	3919	787	20·0714	4·983
40	76849	1116	1·4531	68·823	86	3132	664	21·1955	4·717
41	75733	1149	1·5177	65·876	87	2468	552	22·3673	4·470
42	74584	1180	1·5823	63·211	88	1916	452	23·5868	4·239
43	73404	1208	1·6469	60·716	89	1464	364	24·8539	4·024
44	72196	1235	1·7115	58·411	90	1100	287	26·1210	3·828
45	70961	1266	1·7852	56·022	91	813	223	27·3882	3·651
46	69695	1302	1·8682	53·533	92	590	169	28·6553	3·489
47	68393	1340	1·9604	51·020	93	421	126	29·9225	3·342
48	67053	1382	2·0617	48·497	94	295	92	31·1897	3·206
49	65671	1426	2·1723	46·041	95	203	66	32·5032	3·077
50	64245	1466	2·2829	43·082	96	137	46	33·8471	2·954
51	62779	1502	2·3935	41·771	97	91	32	35·2034	2·841
52	61277	1534	2·5041	39·936	98	59	21	36·5720	2·734
53	59743	1562	2·6147	38·241	99	38	14	37·9710	2·634
54	58181	1585	2·7253	36·697	100	24	24	39·3000	2·545
55	56596	1614	2·8531	35·051					

Equation of Life for the Members of Friendly Societies in the average of the Scotch Cities. This result will no doubt be unexpected by some inquirers, as Dundee has usually been held up as the type of unhealthy Cities; but the present results shew the necessity of extended observations before drawing any conclusions, the remarks made relative to the fluctuation of Mortality in Glasgow being equally applicable to Dundee. The following Abstract will give the comparative value of Male Life in the gross population of Glasgow, Liverpool, and Dundee.

Age.	Expectation of Life in			Age.
	Glasgow, Table R.	Liverpool, Reg. Gen. page xxvii. 5th Report.	Dundee, Table R.	
20	30·9665	33·0000	35·9632	20
25	27·8512	30·0000	32·4423	25
30	24·8998	27 0000	29·0866	30
35	22·1102	23·0000	25·8297	35
40	19·4532	21·0000	22·7017	40
45	16·9366	18·0000	19·8168	45
50	14·5350	16·0000	17·0891	50

The value of life in Dundee will thus be seen to stand higher than in either of the other Cities. If a complete system of Registration existed in Scotland accurate means would be afforded of carrying out a satisfactory inquiry as to the relative value of life in different Districts; but so far as the more imperfect system of Local Registration will admit of judging, it does not appear that the Duration of Life in the large Towns of Scotland should be regarded as so much below that of Cities in England.

Since the preceding paragraphs were written, in 1845, several ineffectual attempts were made to introduce a system of Registration into Scotland, but after many difficulties an Act was at last carried, namely, "The 17th and 18th Vict. c. 80," and which came into operation on the first day of the present year. It is at the same time satisfactory to find that the Legislature has availed itself of the experience gained under the English Registration Act, and has thereby provided for Scotland a Registration system commensurate with the views of those having a practical acquaintance in working such measures. The results will in a few years furnish to scientific inquirers that amount and character of data which are so necessary to the complete solution of many important political and social problems of the times.

It is deemed desirable to insert here the following Report of a Committee of the Statistical Society, consisting of Colonel Sykes, Dr. Bowring, Mr. Fletcher, Mr. Farr, and Mr. Neison.

Report of the Registration Committee to the Council of the Statistical Society, 5th June, 1847.

The Scottish Registration Committee appointed by the Council on the 13th March, 1847, "to consider certain Schedules and Provisions of the proposed Registration Bill for "Scotland, to recommend Forms, and to communicate with the proper Authority on the "subject;" beg to report, that the Committee, at their Meeting on the 16th March, 1847, on examining the proposed Registration Bill, found the Schedules defective in the following particulars, viz.:

In Marriage Schedule—

1. The usual and present residence of the parties omitted.
2. Their ages not given; the parties being inadequately distinguished as "Minors," and of "Full Age."
3. The professions of the parties are omitted, while those of their parents are given instead.
4. "Civil Condition" given, but it would be worth while, in the case of widows and widowers, to know when the parties became such, and how often.
5. The number of children of each party by former marriage not obtained.
6. The place of birth of the parties marrying not stated.
7. The father's name only given, whereas the names of both parents should be furnished.

In Births' Schedule—

1. The items to determine child's identity, inadequate.
2. The birth-place of the parents omitted.
3. The marriage-place of the parents not given.
4. The number and sex of former children omitted.
5. The signatures of the parents from the Register Book should be required.
6. The certificate of the accoucheur, nurse, or persons present is omitted.
7. The place of registry omitted from the entry.

In Deaths' Schedule—

1. The arrangement of the name and description incomplete.
2. A certificate signed by the medical attendant should be required, stating the cause of death, and when the party was last seen by him.
3. The burial place and undertaker's name are omitted.
4. Place of birth and time of residence in the district omitted.
5. The rank or profession, and names of the parents omitted.
6. No statement as to whether married, to whom, at what age, or where.
7. Issue of the marriage living and dead, and the name and age of each should be furnished.
8. The signature of a witness, as well as of the informant, is wanting.

To remedy the defects now pointed out in the Schedules printed with the proposed Bill, the Committee suggested the substitution of the following three forms of Schedules, A, B, and C:—

[In order

COUNTY—Middlesex. DISTRICT—Marylebone. 1847. MARRIAGES Solemnised at the Parish Church of Marylebone.

No.	When, where, and how Married.	Signatures of the Parties.	Residence. Present.	Residence. Usual.	Age.	Rank or Profession.	Condition. If a Widower or Widow. Date of decease of former Wives or Husbands.	Condition. Children by each former Marriage. Living.	Condition. Children by each former Marriage. Dead.	Birth-place.	Parents. Names.	Parents. Rank or Profession.	Witnesses and Officiating Minister.
11	On March 3rd, 1847. At Marylebone Parish Church. Marriage after Banns, was solemnised between us according to the Rites and Ceremonies of the Established Church.	William Hastings	3, South St., Marylebone	Chelmsford, Essex	32	Carpenter	Widower, 4 Nov., 1840	2	1	Bristol	Peter Hastings, dec. and Ann Hastings, m. n. Payne	Upholsterer Schoolmistress	John Hastings, Jane Mitchell, Witnesses.
		Sophia Ann Mitchell	17, High St., Marylebone	17, High St., Marylebone	20	Dressmaker	Spinster			Longbridge, Deverell, Wilts.	Geoffry Mitchell and Sarah Mitchell, m. n. Evans, dec.	Butcher	James Hollingshead, Vicar, Officiating Minister.

SCHEDULE B.—BIRTHS.

COUNTY—Middlesex. DISTRICT—St. Pancras. SUB-DISTRICT—Tottenham Court. BIRTHS Registered by John Wells, Registrar.

No.	Child. Name, and whether present or not.	Child. Sex.	Child. When Born. Year. Day. Hour.	Child. Where Born. If in Lodgings—so stated.	Parents. Father. Name. Rank or Profession. Age. Birth-place.	Parents. Father. When and where Married. Issue Living and Deceased.	Parents. Mother. Name. Maiden name. Rank or Profession. Age. Birth-place.	Informants. Signatures of Father and Mother and other Informants, and Residence if out of the house in which the birth occurred.	Witnesses. Accoucheur, Nurse by whom certified; and Signatures of Occupier or other Witnesses.	When, where, and by whom Registered.
98	William Aste (Present.) Alteration of Name, if any, and date thereof.	M.	1847. February Eleventh. 5h 30m A.M.	169, Tottenham Court Road.	Henry Aste, Corn Dealer, 40, Tingewick, Bucks.	1830, St. Pancras. 4 boys, 4 girls, living. 1 girl, deceased.	Harriet Aste, maiden name, Hills, (her 9th child,) 37, St. Pancras.	Henry Aste, Father. Harriet Aste, Mother	Eupham. Curry, Nurse, Witness. Certified by M. Clayton, Accoucheur.	1847, March 10th, at 169, Tottenham Court Road. John Wells, Registrar.

SCHEDULE C—DEATHS.

COUNTY—Middlesex. DISTRICT—Poplar. SUB-DISTRICT—Poplar. DEATHS Registered by T. W. Gagen, Registrar.

No.	Description. (1) Name. (2) Rank or Profession.	Description. Sex.	Description. Age.	(1) When and (2) Where Died. No. of Street. Year. Day. Hour.	(1) Cause of Death. Disease. (2) Medical Attendant by whom Certified, when he last saw Deceased.	(1) Burial Place. (2) Undertaker by whom Certified.	(1) Where Born, and (2) How long in this District.	(1) Parents' Names, and (2) Rank or Profession.	If Deceased was Married. Where, at what age, and by whom.	If Deceased was Married. Issue, in order of birth, their names and ages.	Signatures of (1) Informant, (2) Witness, and (3) Registrar, (4) Date of Registration.
1476	William Canty, Dock Labourer.	M.	62	1847. February Twenty-eighth. 6½h A.M. At 16, Cottage Row.	Pneumonia, Two months. As certified by H. Bloomfield, M.D., who saw Deceased Feb. 27th.	Catholic Burial Ground, Wade Street. As certified by M. Rutley, Undertaker.	County of Cork, Ireland. 36 years in Poplar.	Timothy Canty, Shoemaker, dec. Mary Canty, m. n. Nicolas, dec.	Scrill parish, Ireland, at age 22, to Honora M'Carty.	1. Timothy, 31 2. William, 30 3. Mary, 29 4. John, dec. at 27, in 1846 5. Catherine, dec. at 1, in 1820 6. Stephen, 21	Honora Canty, her + mark, Widow, Informant. Mary Canty, daughter, Witness. T. W. Gagen, Registrar, March 3rd, 1847.

In order to determine whether any practical difficulties might be found in eliciting for registration the various facts required in those forms, the Committee caused an experiment to be made in several districts of the metropolis, and it was found that all the information needed could be readily obtained from the public, no objection arising on furnishing it. The results of this attempt at practically working out the Schedules were submitted to the Committee, and considered as satisfactory evidence that no insuperable difficulties existed in the way of carrying out the plan on a national scale. Copies of the three Schedules referred to were forwarded to Sir George Grey and the Lord Advocate of Scotland, and subsequently a deputation from the Committee waited on the Lord Advocate, and explained that the object which the Council had in view was simply to assist in securing for Scotland such a form of registration as the present advanced state of statistical science seemed to demand; and believing that a more complete and useful form of registry than that required under the proposed Bill might without difficulty be carried out, the Council of the Statistical Society was anxious that the people of Scotland should possess that system of registration which was best calculated to exhibit their true social and civil condition.

The attention of the Lord Advocate was next directed to the defects in the Schedules of the Bill then passing through the House, and the advantages which it is believed would arise from the adoption of the proposed Schedules A, B, and C were pointed out. Throughout the interview the Lord Advocate entered most fully and minutely into the arguments brought forward by the deputation, and promised to give the whole subject his particular consideration, although he could not engage to adopt all the suggested alterations; and he further expressed it as his opinion, that the better plan would be to pass the present Bills with but little alteration in the Schedules, and to introduce such provisions as would enable the competent authorities, with the sanction of the Queen in Council, to make such alterations and improvements in the modes of registration as experience may shew to be necessary and expedient.

Subsequently to this interview, it was considered advisable to forward Schedules, on the model of those suggested, for use to some district of Scotland in order to discover whether any difficulty was likely to arise in that part of the kingdom, with respect to the peculiar form of registration suggested. Dr. Watt, of Glasgow, who has had great experience in such matters, kindly undertook to practically test the Schedules in that city, and the Committee, at its meeting on the 15th ultimo, was furnished with the results obtained by Dr. Watt, consisting of a number of Registrations of the "Private Burials in the "Cathedral burying-grounds," of "Poor buried at the public expense," and of "Burials by the Royal Infirmary of Glasgow." The following extract from a letter of Dr. Watt, will shew that he considers no difficulties exist in the way of getting the Schedules filled up:—

" As Mr. Farr did not state the time at which he wished the enclosed schedules returned to him, I have delayed making the returns till they could be filled up for a complete month. I regret, however, that some little delay has taken place in obtaining the returns for the poor buried at the public expense, and from the Royal Infirmary. These schedules have been filled up by the parties who make the returns for the Glasgow Mortality Bills, and who receive very small salaries for their respective labours. They offered to make out clean copies of the schedules, but I think it better to transmit them off hand in their original state.

" It will be observed that some of the lists are not so complete as could be wished. This arises from the informants not being aware that so much information was required of them. Were it known to the public that the various particulars stated in the schedules were required, I have no doubt but they could, without difficulty, be filled up with accuracy for Glasgow. *From what I know of the subject, I have no doubt but they would be filled up with perfect accuracy, provided care is taken to appoint properly qualified persons as registrars.*"

Your Committee was further of opinion that, in the event of such Schedules being adopted, great advantage would result to the public, by issuing forms of certificates embodying the principal facts intended to be set forth in the Schedules themselves, and that they should be delivered, by the respective Registrars, to the parties interested on the various occasions of Marriage, Birth, and Death. That these should be regarded as the " Original Certificates," and have appropriate counterparts, and that no other original certificates should ever be issued of any one of these events, but that any other documents of a similar kind which might be issued should only be a certified copy by the proper Registrar.

(A.)

CERTIFICATE OF MARRIAGE.

DISTRICT, Marylebone. No. in Register, 11.
On March 3rd, 1847.
At Marylebone Parish Church.

MARRIAGE, *after Banns,* was solemnised between US, according to *the rites and ceremonies of the Established Church.*

SIGNATURE, *William Hastings.*

DESCRIPTION
- residence { present, } 3, *South Street, Marylebone.* / { usual, } *Chelmsford, Essex.*
- age, 32.
- rank or profession, *carpenter.*
- condition, *widower.*
- if widower { former wives, } first deceased in 1840, *4th Nov.* { children by, living 2, dead 1.
- birth-place, *Bristol.*
- parents' names and rank or profession, } *Peter Hastings, dec., upholsterer, and Ann Hastings,* M. N. *Payne, schoolmistress.*

SIGNATURE, *Sophia Ann Mitchell.*

DESCRIPTION { residence { present, } 17, *High Street.*
usual, } *Ditto.*
age, 20.
rank or profession, *dressmaker.*
condition, *spinster.*
if widow { former husband } first deceased in ... ... } children by living — dead —
birth-place, *Longbridge, Deverell, Wilts.*
parents' names and rank or profession, } *Geoffrey Mitchell, butcher, and Sarah Mitchell,* M. N. *Evans, dec.*

WITNESSES, *John Hastings—Jane Mitchell.*

OFFICIATING MINISTER, *James Hollingshead, Vicar.*

(B.)

CERTIFICATE OF BIRTH.

DISTRICT, St. Pancras. SUB-DISTRICT, Tottenham Court. No. in Register, 98.

CHILD, Name, and Sex, *William Aste,* (present,) born 5*h.* 30*m.*, February 11th, 1847, *at* 169, *Tottenham Court Road.*

PARENTS—Father { name, *Henry Aste.*
rank or profession, *corn dealer.*
age, 40.
born at *Tingewick, Bucks.*
married first in 1830 *at St. Pancras.*
issue, 4 boys, 4 girls, living; 1 girl dec.

Mother { name, *Harriett Aste,* M. N. *Hills* (*her ninth child*).
rank or profession,
age, 37.
born at *St. Pancras.*
married first in (*see Father.*)
issue, *ditto.*

INFORMANTS AND THEIR SIGNATURE, *Henry Aste, father; Harriett Aste, mother.*

WITNESSES, *Euphemia Curry,* nurse, certified by *M. Clayton,* accoucheur.

REGISTERED, on March 10th, 1847, at 169, *Tottenham Court Road, by John Wells, Registrar.*

(C.)

CERTIFICATE OF DEATH.

DISTRICT, Poplar. SUB-DISTRICT, Poplar. No. in Register, 1746.

NAME { *William Canty.*
rank or profession, *dock labourer.*
sex, *male.*
age, 62.
died on the 28*th of February,* 1847, 6½, A.M., *at* 16, *Cottage Row.*

CAUSE OF DEATH, *Pneumonia, two months,* as certified by *H. Bloomfield,* who last saw deceased *February 27th,* 1847.

Burial place, *Catholic burial-ground, Wade Street,* as certified by *M. Rutley, undertaker.*

BORN AT *county of Cork, Ireland*; lived in this district, 36 *years in Poplar.*

Parents' names and rank or profession, { Father—*Timothy Canty, shoemaker, dec.* Mother—*Mary Canty,* M. N. *Nicholas, dec.*

Married in the *parish of Scrill, Ireland, at the age of* 22, *to Honora M'Carty, by whom he had*

Issue, (1) *Timothy,* 31, (2) *William,* 30, (3) *Mary,* 29, (4) *John, dec. at* 27, *in* 1846, (5) *Catherine, dec. at* 1, *in* 1820, (6) *Stephen,* 21.

Informant, *Honora Canty, her* × *mark, widow.*

Witness, *Mary Canty, daughter.*

Registered on March 3rd, 1847, by *T. W. Gagen, Registrar.*

The Committee, after having given much attention to this subject, are convinced that the adoption of the proposed system of registration possesses scientific and legal merits beyond those of any other yet proposed in this country, and they regret that the framers of the Registration Bill for Scotland have not wholly concurred with them in their view of the question. As it is now understood, however, that the Bill will not pass during the present session of Parliament, and that the whole is likely to be further considered, it is to be hoped, from the willingness which the Lord Advocate evinced to introduce an efficient mode of registration, that reason will be found hereafter to carry out the system proposed by your Committee.

5th June, 1847.

On referring to the Schedules of the Registration Act for Scotland, the 17th and 18th Vict. c. 80, it will be found that they are almost identical with the preceding forms recommended for adoption by the Committee of the Statistical Society, and it is to be hoped, that the advantages to arise from so complete a form of Registration, will induce the Legislature to extend the improvements to the system now in use in England. It is very likely that in the first attempts to carry out these Schedules some difficulties will be experienced in Scotland, where no National Registration formerly existed, and during the first few years, the people will need to be instructed as to the precise kind of information required to be furnished in the event of a Birth, Death, or Marriage. At the date of the Committee drawing up the preceding Report, the practicability of the scheme was tested by Mr. Farr personally, in two different districts of the metropolis, and also by Dr. Watt in Glasgow, and the experiments fully satisfied the Committee that any attempt to carry out the system on a large scale must be successful, and that any difficulties which might be experienced at the beginning could only be of a temporary duration.

For many purposes, the mode of representing the value of life at various ages, under the expression "Expectation of Life," will be found inadequate. The method by which that value is obtained for a given age, involves the consideration of the decrements of life at every superior age; and therefore, in any Table, the Expectation of Life, even at younger ages, will be affected by the irregularities of mortality at the older ages. It

consequently sometimes happens that a comparison of different Tables, especially at the younger and middle periods of life, may shew an equal or nearly equal Expectation while there are in reality very different chances under the two Tables of living a given number of years; and again, Expectation Tables may shew very different values for the same age, when according to the nature of the data there are equal chances of living the same number of years.

From what has been said it will be seen, that although the "Expectation of Life" expresses the true average duration in years of a certain number of individuals at a given age, yet it does not represent the chances of surviving an equivalent number of years; and consequently, for medical and other purposes, in which it is required to determine the relative value, improvement, or other change which may have taken place within a given period of life, another expression must be found. The Equation of Life, which represents a term of years for which there is an equal probability of living, appears to be the best mode to determine the comparative value of life in different Classes or different Districts, within the same period of years, as the expression is affected by the mortality within those ages only. In order to shew the relation which the Equation of Life bears to the Expectation of Life, the expression under each form, corresponding to the decennial ages, are given for various classes of results in

Table U.

Equation of Life.—England and Wales.

Age.	England and Wales.				Friendly Societies (Males).								Females.		Age.
	Males.		Females.		Rural Districts.		Town Districts.		City Districts.		Rural, Town, & City.		Rural, Town, & City.		
	Equation.	Expectation.	Equation.	Expectation.	Equation.	Expectation.	Equation.	Expectation.	Equation.	Expectation.	Equation.	Expectation.	Equation.	Expectation.	
10	52·305	47·756	53·554	48·383	58·375	53·258	54·315	50·537	51·743	47·913	56·408	51·810	56·749	49·493	10
20	44·212	40·691	43·706	41·598	49·353	45·355	45·201	42·274	43·052	40·015	47·434	43·774	49·702	45·264	20
30	36·482	34·099	38·066	35·167	40·813	38·407	36·517	34·575	34·920	32·860	38·972	36·605	41·017	38·184	30
40	28·790	27·476	30·412	28·733	32·129	30·972	28·135	27·153	27·218	26·087	30·531	29·331	32·248	30·781	40
50	21·255	20·846	22·697	22·055	23·609	23·470	20·053	19·973	20·056	19·927	22·344	22·192	23·894	23·820	50
60	14·285	14·585	15·355	15·523	15·923	16·652	12·815	13·761	13·295	13·769	14·945	15·694	16·236	17·238	60

Scotland.—Friendly Societies.—*Males.*

Age.	Rural Districts.		Town Districts.		City Districts.		Rural, Town, and City.		Age.
	Equation.	Expectation.	Equation.	Expectation.	Equation.	Expectation.	Equation.	Expectation.	
10	57·474	53·051	55·828	50·743	43·371	42·637	54·567	50·803	10
20	48·467	44·990	46·407	42·752	34·753	34·586	45·056	42·722	20
30	39·995	37·783	37·106	35·040	27·831	28·635	37·478	35·651	30
40	31·493	30·305	28·020	27·641	21·255	22·647	29·539	28·657	40
50	23·266	22·898	19·441	20·742	16·409	17·386	21·917	21·812	50
60	15·990	16·018	11·217	13·121	12·688	13·335	15·174	15·018	60

TRADES IN FRIENDLY SOCIETIES (MALES) ENGLAND.

Age.	Labourers. Rural Districts.		Clerks. Rural, Town, and City.		Plumbers, Painters, and Glaziers. Rural, Town, and City.		Bakers. Rural, Town, and City.		Miners. Rural, Town, and City.		Age.
	Equation.	Expectation.	Equation.	Expectation.	Equation.	Expectation.	Equation.	Expectation.	Equation.	Expectation	
10	61·512	56·005	41·920	39·985	46·666	43·066	49·546	47·982	51·402	48·516	10
20	52·240	47·906	33·500	31·835	39·101	36·904	41·034	40·027	42·186	40·670	20
30	43·341	40·597	27·416	27·576	31·262	30·508	33·039	32·357	33·187	33·157	30
40	34 349	32·769	19·945	21·857	23 508	24·305	25·001	24·476	24·067	24·920	40
50	25·634	25·075	13·548	16·046	15·384	17·096	19·470	19·091	15·890	17·535	50
60	17·574	17·821	11·616	12 426	9·779	12·168	13·630	14·063	10·414	11·859	60

The terms in the respective columns headed Equation, were determined as follows:—

Let ϵ_x = the number alive in the columns headed "Living" in Tables C, F, I, &c., &c., at the given age x.

Then $\frac{\epsilon_x}{2}$ = the number alive at an advanced age $x+n$ which will always be intermediate between the proximate years of age $x+n-\phi$, and $x+n+1-\phi$ the fraction ϕ of which is determined as follows:—

$$\lambda\left(\epsilon_{x+n-\phi} - \epsilon_{x+n}\right) - \lambda\left(\epsilon_{x+n-\phi} - \epsilon_{x+n+1-\phi}\right),$$

$$\text{or } \phi = \frac{\epsilon_{x+n-\phi} - \epsilon_{x+n}}{\epsilon_{x+n-\phi} - \epsilon_{x+n+1-\phi}}$$

where $\epsilon_{x+n} = \frac{1}{2}\,\epsilon_x$.

An inspection of Table U will shew, that at the earlier ages the Equation of Life always exceeds the Expectation, and at those ages there is always an even chance of outliving the period of years represented by the Expectation of Life; but the converse is the case for the older ages. It will be further seen, that in those Tables giving a higher absolute value to Life, the Equation retains its superiority over the Expectation till a more advanced period of years; or in other words, if the Equation and Expectation of Life in any Table be compared, the more advanced the period of life at which the two expressions approximate to equal values, the higher is the absolute value of life throughout that Table. An example of this will be seen in observing the respective terms for the City and Rural Districts, in the former of which the approximation happens ten years earlier than in the other: again, if the results for the Labourers in the Rural Districts be compared with the results for Clerks, thirty years' difference will be found; and on comparison of the results for other Classes in Table U, intermediate periods of approximation will appear.

ON THE RATE OF MORTALITY IN THE MEDICAL PROFESSION.

Recently I have had occasion to investigate the rate of mortality among two different classes of medical men; the one class being the Officers of the Medical Department of the Royal Army, and the other, the Members of the Royal Medical Chirurgical Society. The facts relating to the former were collected from the records of the Society formed for the benefit of the Widows of the Officers of the Medical Department of Her Majesty's Army, established in the year 1816, and the facts relating to the latter class were abstracted from the books of the Royal Medical Chirurgical Society, established in the year 1805.

The investigation, so far as related to the first group of facts, was required to be conducted with the greatest care and scrutiny, as the management of large pecuniary interests depended on the results. The utmost care was, therefore, exercised in this part of the analysis. Inquirers into vital statistics had not hitherto touched the question of the mortality among the members of the medical department of the army, but from their peculiar duties, and the varied climates to which so many of them are exposed, there was reason to believe that some unusual feature would shew itself in the mortality to which they are subject, and, therefore, under this conviction, it appeared absolutely necessary to determine, from the records of the Society, the rate of mortality to which its own members had been subject. After a somewhat laborious and very troublesome analysis of all the information procurable, the following exhibits the results arrived at. In the course of this analysis it was discovered that the social condition of the members had an important influence on the rate of mortality: and it was rendered necessary finally to exhibit the rate of mortality in connection with these conditions. It will be found that the results are not only exceedingly curious but of great practical importance.

In the following Table are exhibited the principal elementary facts from which to determine the rate of mortality among the members of the Society, who entered it unmarried, from its establishment, in 1816, until the 1st of January, 1851; excluding only such members as entered it in the married condition of life.

[The arrangement

Table I.

Mortality among Members entering Single.

Age.	Number Entered at each Age.	Number remaining under Observation from Age preceding.	Total Number under Observation at each Age.	Died.	Struck off.	Discontinued.	Alive.	Total gone off.	Half of				Number Exposed to Risk.
									Entered.	Struck off.	Discontinued.	Total.	
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*	*k*	*l*	*m*	*n*
17	3	..	3	..	..	..	..	..	1·5	..	..	1·5	1·5
18	1	3	4	..	..	..	..	..	·5	..	..	·5	3·5
19	2	4	6	..	..	..	..	..	1	..	..	1	5
20	21	6	27	2	..	..	..	2	10·5	..	..	10·5	16·5
21	99	25	124	9	..	3	..	12	49·5	..	1·5	51	73
22	141	112	253	12	7	5	5	29	70·5	3·5	2·5	76·5	176·5
23	195	224	419	17	6	12	14	49	97·5	3	6	106·5	312·5
24	153	370	523	11	9	8	11	39	76·5	4·5	4	85	438
25	168	484	652	26	15	12	25	78	84	7·5	6	97·5	554·5
26	133	574	707	25	19	24	24	92	66·5	9·5	12	88	619
27	62	615	677	10	15	16	25	66	31	7·5	8	46·5	630·5
28	41	611	652	12	19	14	25	70	20·5	9·5	7	37	615
29	32	582	614	15	12	12	22	61	16	6	6	28	586
30	17	553	570	10	12	12	23	57	8·5	6	6	20·5	549·5
31	31	513	544	13	5	10	28	56	15·5	2·5	5	23	521
32	32	488	520	17	6	5	29	57	16	3	2·5	21·5	498·5
33	24	463	487	12	2	4	20	38	12	1	2	15	472
34	28	449	477	8	5	7	22	42	14	2·5	3·5	20	457
35	25	435	460	11	3	6	15	35	12·5	1·5	3	17	443
36	19	425	444	7	3	4	17	31	9·5	1·5	2	13	431
37	13	413	416	12	4	7	12	35	6·5	2	3·5	12	404
38	12	391	403	7	..	4	8	19	6	..	2	8	395
39	20	384	404	4	2	4	9	19	10	1	2	13	391
40	14	385	399	10	1	4	6	21	7	·5	2	9·5	389·5
41	9	378	387	14	3	8	11	36	4·5	1·5	4	10	377
42	9	351	360	12	1	11	5	29	4·5	·5	5·5	10 5	349·5
43	3	331	334	5	1	7	1	14	1·5	·5	3·5	5·5	328·5
44	6	320	326	3	1	5	4	13	3	·5	2·5	6	320
45	6	313	319	5	2	4	7	18	3	1	2	6	313
46	3	301	304	7	2	2	4	15	1·5	1	1	3·5	300·5
47	4	289	293	3	1	2	4	10	2	·5	1	3·5	289 5
48	3	283	286	4	1	7	7	19	1·5	·5	3·5	5·5	280·5
49	..	267	267	5	1	6	5	17	..	·5	3	3·5	263·5
50	..	250	250	6	..	1	2	9	..	..	·5	·5	249·5
51	2	241	243	6	3	4	5	18	1	1·5	2	4·5	238·5
52	..	225	225	5	1	6	1	13	..	·5	3	3·5	221·5
53	..	212	212	2	1	3	2	8	..	·5	1·5	2	210
54	3	204	207	8	..	1	3	12	1·5	..	·5	2	205
55	2	195	197	5	..	3	4	12	1	..	1·5	2·5	194·5
56	..	185	185	4	4	2	9	19	..	2	1	3	182
57	1	166	167	..	..	2	3	5	·5	..	1	1·5	165·5
58	..	162	162	7	2	7	10	26	..	1	3·5	4·5	157·5
59	1	136	137	3	1	4	8	16	·5	..	2	3	134
60	..	121	121	1	..	1	11	13	..	·5	·5	·5	120·5
61	..	108	108	3	2	..	6	11	..	1	..	1	107
62	..	97	97	2	..	..	9	11	..	..	..	..	97
63	..	86	86	4	..	2	5	11	..	..	1	1	85
64	..	75	75	2	..	2	4	8	..	..	1	1	74
65	1	67	68	2	2	..	3	7	·5	1	..	1·5	66·5
66	1	61	62	3	1	1	6	11	·5	..	·5	1·5	60·5
67	..	..	51	1	..	..	5	6	..	·5	..	..	51
68	..	..	45	2	1	1	4	8	..	..	·5	1	44
69	..	..	37	..	..	..	4	4	..	·5	..	..	37
70	..	..	33	3	..	..	3	6	..	..	..	..	33
71	..	..	27	..	..	..	2	2	..	..	..	..	27
72	..	..	25	2	..	..	2	4	..	..	..	..	25
73	..	..	21	2	..	..	1	3	..	..	..	..	21
74	..	..	18	1	..	2	2	5	..	..	1	1	17
75	..	..	13	..	..	..	2	2	..	..	..	..	13
76	..	..	11	..	..	1	1	2	..	..	·5	·5	10·5
77	..	..	9	1	..	..	2	3	..	..	..	..	9
78	..	..	6	2	..	..	..	2	..	..	..	..	6
79	..	..	4	..	..	..	1	1	..	..	..	..	4
80	..	..	3	1	..	..	1	2	..	..	..	..	3
81	..	..	1	..	..	..	1	1	..	..	..	..	1
82	..	..	..	..	..	..	..	..	..	..	..	..	..
83	..	..	..	..	..	..	..	..	..	..	..	..	..
84	..	..	..	..	..	..	..	..	..	..	..	..	..
85	..	..	..	..	..	..	..	..	..	..	..	..	..
	1,340	..	15,567	386	176	268	510	1,340	670·0	88·0	134·0	892·0	14675·0

The arrangement of this Table is very simple, and will be readily understood by those giving attention to such inquiries; but to those not familiar with them, the following explanation may be useful.

Column (*a*) Represents the age at which each officer entered the society, or when some other event connected therewith took place.

(*b*) The number of officers entered at each age.

(*c*) The number of officers remaining under observation from each preceding age, and the residue of all those entering in each preceding age, who have not become subject to any of the contingent events represented in the adjoining columns. For example, three officers entered at the age of 17, and not falling under the events specified in the adjoining columns, they survive until the succeeding age, and come under observation as officers of the age of 18.

(*d*) Again, 1 officer entered at the age of 18, who, with the 3 remaining from those that entered the society at the age of 17, makes 4, coming under observation at some time or other after completing the 17th year of their life, and before completing the 18th year; none of these become subject to any of the events specified, and the whole 4 are therefore carried under observation to the following age, 19, when 2 other officers entered the society, making 6 under observation at the age of 19. Again, at age 25, 168 officers entered the society, who, with 484 remaining under observation from the preceding age, make altogether 652 under observation at the age of 25. Of these, 26 die during the course of that year, 15 are struck off, and 12 discontinue, while 25, who have recently entered the society, remain alive on the 1st of January, 1851, and, therefore, are no longer observed; 78 officers, in all, therefore, go from under observation at the age of 25, and 574 are carried forward to the succeeding age of 26, which, with 133 entered at that age, brings 707 officers altogether under review at the age of 26.

(*e*) Represents the numbers dying at each age or term of life.

(*f*) Those who are struck off.

(*g*) Those who discontinue.

(*h*) Represents the number of officers alive on the 1st of January, 1851, and who have not become subject to any of the contingent events represented in columns *e* to *g* inclusive.

(*i*) Contains the total of columns *e* to *h*, inclusive, and represents the number of officers who cease to come under observation in any of the more advanced ages. For example, at the age 30, column *d* represents 570 under observation; but before attaining the 31st year of age, 57 of these pass from observation, leaving 513 to come under observation in the 31st year of age, as shewn in column *c*.

(*j*) Represents one-half of the numbers entering the society at each year of life at which admissions take place, and is, therefore, one-half of the numbers in column *b*. In like manner, column

(*k*) Represents one-half of the numbers in column *f*. In like manner, column

(*l*) Represents one-half the numbers in column *g*; and column

(*m*) The total of columns *j*, *k*, and *l*. The purpose of these four columns will appear in the explanation of column

(*n*) Which represents the number of lives exposed a complete year to the risk of mortality while connected with the society, and the figures in this column are produced by subtracting from the numbers in column *d* the numbers in column *m* opposite the same age. As already stated, column *d* contains the gross number under observation at some time or other throughout the year of life set forth in column *a*; but as column *b* contains, for each age up to 66, the numbers who have entered the society, and as officers, one with another, enter at different periods throughout the year, it has been found, by observation, that on an average each is, during the year of entry, exposed to only six months, or one half-year's mortality, and hence column *j* represents that amount of risk for all officers who have just joined the society. In like manner columns *k* and *l* represent the amount of risk to which officers discontinued from the society for either of the causes specified in those columns, are exposed, on the principle that, one with another, the discontinuances will take place in the middle of the year. It thus appears that as column *m* is the total of *j*, *k*, and *l*, it shews the proper number to be deducted from column *d*, in order to find the number exposed to the risk of a whole year's mortality.

The following Abstract, A, will make the contents of the preceding Table better understood.

ABSTRACT A.

Ages.	Number Exposed to Risk.	Died.	Mortality per Cent.
20 to 24	1016·5	51	5·017
25 ... 29	3005·0	88	2·928
30 ... 34	2498·0	60	2·402
35 ... 39	2064·0	41	1·986
40 ... 44	1764·5	44	2·494
45 ... 49	1447·0	24	1·660
50 ... 54	1124·5	27	2·401
55 ... 59	833·5	19	2·280
60 ... 64	483·5	12	2·482
65 ... 69	259·0	8	3·089
70 ... 74	123·0	8	6·504
75 ... 79	42·5	3	7·059
80 ... 84	4·0	1	25·000
Total.....	14665·0	386	2·632

It is thus seen that during 14,665 years of risk, to which the members whose experience is recorded in Table I were exposed, no less than 386 died, or 2·632 per cent., while the mortality according to the average for the whole male population of England and Wales at corresponding ages is 1·888 per cent. But what is most striking about these results is the very excessive mortality at the ages under 55, and the reduced mortality at the ages 55 and upwards. This will be found to exceed not only the mortality of the male population of England and Wales at the mature and active term of life, but to be actually about equal to that of the officers of the Bengal military service at the corresponding ages. The following exhibits the results for each of the three classes:—

Mortality in the term of life, 20–54 among

The Members of the Medical Department of the Army = 2·593 per cent.
The Officers of the Bengal Army . . . . . = 2·635 ...
The Male Population of England and Wales . . . = 1·155 ...

It is thus evident that the rate of mortality among the members of the medical department of the army, who entered the Society while unmarried, does not differ widely

from that found to prevail among the officers of the Bengal army; but at the same time it will be found to exceed the rate of mortality among the male population of this country by 124·502 per cent. This very striking and unexpected result at once proved the necessity for an accurate analysis of the rate of mortality among the members of the Society.

In the preceding Abstract A, there is one feature which cannot fail to arrest attention: the remarkably high and unprecedented mortality at the younger ages, which gradually decreases up to the age of 40. The following shews the mortality per cent. for each quinquennium in the three preceding groups of observations:—

Ages.	Medical Department of the Royal Army.	Bengal Military Fund.	Male Population of England and Wales.
20 to 24	5·017	2·324	0·845
25 ... 29	2·928	2·501	0·981
30 ... 34	2·402	2·779	1·049
35 ... 39	1·986	2·864	1·134

The mortality at the younger ages in the medical department of the army is certainly a circumstance of much importance; and on more grounds than one, calls for investigation and inquiry: but in order to shew how very diversified is the rate of mortality in individual classes of the community, it may be well to direct attention to the remarkable contrasts in the results of the three preceding groups, at ages 55 and upwards, or rather within the term of life, 55–84.

The rate of mortality in each of the following classes in the term of life 55–84:

Members of the Medical Department of the Royal Army = 2·922 per cent.
Officers of the Bengal Army . . . . . = 5·652 ...
Male Population of England and Wales . . . . . = 5·056 ...

The very low rate of mortality at the advanced ages among the members of the medical department of the army, as set forth in Abstract A, is just as remarkable as the excessive rate found to prevail at the younger ages.

So much having been said on the rate of mortality among those members who entered the Society while single or unmarried, attention will next be directed to those who joined the Society as married members.

The explanation already given of the construction of Table I will be equally applicable to the following Table, and, therefore, need not be repeated.

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Table II.

Mortality of those who entered Married.

Age.	Number Entered at each Age.	Number remaining under Observation from Age preceding.	Total Number under Observation at each Age.	Died.	Struck off.	Discontinued.	Alive.	Total gone off.	Half of				Number Exposed to Risk.
									Entered.	Struck off.	Discontinued.	Total.	
21	1	..	1	..	..	..	..	..	·5	..	..	·5	·5
22	1	1	2	..	..	1	..	1	·5	..	·5	1	1
23	1	1	2	..	..	..	..	..	·5	..	..	·5	1·5
24	3	2	5	..	..	1	..	1	1·5	..	·5	2	3
25	3	4	7	..	..	..	..	..	1·5	..	..	1·5	5·5
26	8	7	15	..	..	..	..	..	4	..	..	4	11
27	5	15	20	1	..	..	..	1	2·5	..	..	2·5	17·5
28	6	19	25	..	..	..	..	..	3	..	..	3	22
29	6	25	31	..	..	..	..	..	3	..	..	3	28
30	5	31	36	1	..	..	..	1	2·5	..	..	2·5	33·5
31	9	35	44	..	..	1	..	1	4·5	..	·5	5	39
32	12	43	55	..	..	..	..	..	6	..	..	6	49
33	11	55	66	..	..	..	..	..	5·5	..	..	5·5	60·5
34	13	66	79	..	1	1	..	2	6·5	·5	·5	7·5	71·5
35	7	77	84	5	..	..	..	5	3·5	..	..	3 5	80·5
36	8	79	87	..	..	1	..	1	4	..	·5	4·5	82·5
37	10	86	96	1	1	..	..	2	5	·5	..	5·5	90·5
38	5	94	99	2	..	..	..	2	2·5	..	..	2·5	96·5
39	9	97	106	1	..	..	1	2	4·5	..	..	4·5	101·5
40	11	104	115	3	..	..	..	3	5·5	..	..	5·5	109·5
41	6	112	118	3	..	1	..	4	3	..	·5	3·5	114·5
42	6	114	120	2	..	1	..	3	3	..	·5	3·5	116·5
43	10	117	127	1	..	1	..	2	5	..	·5	5·5	121·5
44	6	126	131	2	..	1	..	3	3	..	·5	3·5	127·5
45	9	128	137	4	..	..	..	4	4·5	..	..	4·5	132·5
46	9	133	142	3	..	..	1	4	4·5	..	..	4·5	137·5
47	1	138	139	2	..	..	..	2	·5	..	..	·5	138·5
48	..	137	137	..	1	1	..	2	..	·5	·5	1	136
49	5	135	140	1	..	..	..	1	2·5	..	..	2·5	137·5
50	..	139	139	3	..	..	..	3	..	..	..	..	139
51	1	136	137	8	..	..	1	9	·5	..	..	·5	136·5
52	3	128	131	..	..	2	..	2	1·5	..	1	2·5	128·5
53	2	129	131	1	..	..	1	2	1	..	..	1	130
54	2	129	131	7	..	1	..	8	1	..	·5	1·5	129·5
55	..	123	123	4	1	1	..	6	..	·5	·5	1	122
56	1	117	118	3	..	1	..	4	·5	..	·5	1	117
57	1	114	115	5	..	..	..	5	·5	..	..	·5	114·5
58	..	110	110	4	..	1	2	7	..	..	·5	·5	109·5
59	2	103	105	5	1	..	3	9	1	·5	..	1·5	103·5
60	1	96	97	2	..	1	2	5	·5	..	·5	1	96
61	..	92	92	4	..	1	4	9	..	..	·5	·5	91·5
62	1	83	84	3	..	..	..	3	·5	..	..	·5	83·5
63	..	81	81	1	1	..	2	4	..	·5	..	·5	80·5
64	..	77	77	4	..	..	2	6	..	..	..	..	77
65	1	71	72	1	..	..	3	4	·5	..	..	·5	71·5
66	..	68	68	1	..	1	3	5	..	..	·5	·5	67·5
67	..	63	63	3	..	..	2	5	..	..	..	..	63
68	..	58	58	3	..	..	3	6	..	..	..	..	58
69	..	52	52	3	..	1	5	9	..	..	·5	·5	51·5
70	..	43	43	3	..	..	2	5	..	..	..	..	43
71	..	38	38	3	1	1	1	6	..	·5	·5	1	37
72	..	32	32	4	..	1	1	6	..	..	·5	·5	31·5
73	..	26	26	1	..	1	1	3	..	..	·5	·5	25·5
74	1	23	23	1	..	..	..	1	·5	..	..	·5	22·5
75	..	..	23	..	..	..	2	2	..	..	..	..	23
76	..	..	21	4	..	1	..	5	..	..	·5	·5	20·5
77	..	..	16	1	..	..	..	1	..	..	..	..	16
78	..	..	15	3	..	..	3	6	..	..	..	..	15
79	..	..	9	1	..	..	2	3	..	..	..	..	9
80	..	..	6	..	..	..	3	3	..	..	..	..	6
81	..	..	3	..	..	..	1	1	..	..	..	..	3
82	..	..	2	2	..	..	..	2	..	..	..	..	2
83	..	..	..	..	..	..	..	..	..	..	..	..	..
84	..	..	..	..	..	..	..	..	..	..	..	..	..
85	..	..	..	..	..	..	..	..	..	..	..	..	..
	202	..	4,407	120	7	24	51	202	101·0	3·5	12·0	116·5	4290·5

The following Abstract will make the contents of Table II better understood.

ABSTRACT B.

Ages.	Number Exposed to Risk.	Died.	Mortality per Cent.
25 to 29	84·0	1	1·190
30 ... 34	253·5	1	·395
35 ... 39	451·5	9	1·993
40 ... 44	589·5	11	1·866
45 ... 49	682·0	10	1·466
50 ... 54	663·5	19	2·863
55 ... 59	566·5	21	3·823
60 ... 64	428·5	14	3·267
65 ... 69	311·5	11	3·531
70 ... 74	159·5	12	7·524
75 ... 79	83·5	9	10·778
80 ... 84	11·0	2	18·181
Total	4284·5	120	2·801

It is thus found that while the collected results for the preceding Abstract shew a somewhat higher mortality than that in Abstract A, there is still a great dissimilarity at the different periods of life. The mortality, as given in Abstract B, which represents the deaths among such members as entered the Society when married, being more in accordance with the results derived from observations on other classes of society, exhibiting an increasing rate of mortality as life advances, and pretty uniformly exceeding that for England and Wales; the few irregularities may be fairly supposed to arise from the fluctuations due to the comparatively small number of facts over which the observations recorded in Abstract B extend.

In order to compare the results in this Abstract with those already furnished in Abstract A, it will be sufficient to give the rate of mortality within the periods of 25–54 and 55–84.

Ages.	Mortality per Cent. among those Members who entered the Society	
	Unmarried, Abstract A.	Married, Abstract B.
25 to 54	2·386	1·872
55 ... 84	2·922	4·422

This Abstract affords abundant evidence in support of the conclusion that there is some circumstance connected with the mode or condition of life in which the members of the two classes were placed, having a marked influence on their health and longevity. It is, however, unnecessary to dwell longer on the difference between the preceding two classes, for it is obvious that, in Abstract A, which includes the group entering the Society while unmarried, many of them must have married subsequent to the date of entry, and therefore the results do not afford a proper comparison between the mortality incidental to the conditions of married and single life; another analysis has, therefore, been made to shew the results peculiar to those conditions.

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Table III.

Mortality among Members entering Single, and remaining under Observation whilst Single only.

Age.	Number Entered at each Age.	Number remaining under Observation from Age preceding.	Total Number under Observation at each Age.	Died.	Struck off.	Discontinued.	Married.	Alive.	Total gone off.	Half of				Total.	Number Exposed to Risk.
										Entered.	Struck off.	Discontinued.	Married.		
17	3	..	3	..	..	..	..	..	..	1·5	..	..	..	1·5	1 5
18	1	3	4	..	..	..	..	..	..	·5	..	..	..	·5	3·5
19	2	4	6	..	..	..	..	..	..	1	..	..	..	1	5
20	21	6	27	2	..	..	..	..	2	10·5	..	..	..	10·5	16·5
21	99	25	124	9	..	3	..	..	12	49·5	..	1·5	..	51	73
22	141	112	253	12	7	4	1	5	29	70·5	3·5	2	·5	76·5	176·5
23	195	224	419	17	6	12	3	14	52	97·5	3	6	1·5	108	311
24	153	367	520	11	9	8	2	11	41	76·5	4·5	4	1	86	434
25	168	479	647	25	15	12	5	25	82	84	7·5	6	2·5	100	547
26	133	565	698	25	19	23	6	24	97	66·5	9 5	11·5	3	90·5	607·5
27	62	601	663	10	15	15	9	25	74	31	7·5	7·5	4·5	50·5	612·5
28	41	589	630	12	19	12	12	24	79	20·5	9·5	6	6	42	588
29	32	551	583	13	12	10	12	20	67	16	6	5	6	33	550
30	17	516	533	9	12	11	20	20	72	8 5	6	5·5	10	30	503
31	31	461	492	10	5	10	17	24	66	15·5	2·5	5	8·5	31 5	460·5
32	32	426	458	16	6	4	16	26	68	16	3	2	8	29	429
33	24	390	414	12	2	2	16	18	50	12	1	1	8	22	392
34	28	364	392	8	5	7	12	17	49	14	2·5	3·5	6	26	366
35	25	343	368	8	2	4	10	11	35	12·5	1	2	5	20·5	347·5
36	19	333	352	7	3	3	12	15	40	9·5	1·5	1·5	6	18·5	333·5
37	13	312	325	11	3	7	7	10	38	6 5	1·5	3·5	3·5	15	310
38	12	287	299	6	..	4	17	6	33	6	..	2	8·5	16·5	282·5
39	20	266	286	1	2	4	7	6	20	10	1	2	3·5	16·5	269·5
40	14	266	280	8	1	4	6	4	23	7	·5	2	3	12·5	267·5
41	9	257	266	13	3	7	3	8	34	4·5	1·5	3·5	1·5	11	255
42	9	232	241	9	1	7	6	2	25	4·5	·5	3·5	3	11·5	229·5
43	3	216	219	4	..	6	6	1	17	1·5	..	3	3	7·5	211·5
44	6	202	208	2	1	5	7	3	18	3	·5	2·5	3·5	9·5	198·5
45	6	190	196	3	2	3	4	2	14	3	1	1·5	2	7·5	188 5
46	3	182	185	3	1	2	3	3	12	1·5	·5	1	1·5	4·5	180·5
47	4	173	177	2	1	1	2	2	8	2	·5	·5	1	4	173
48	3	169	172	1	..	7	3	5	16	1·5	..	3·5	1·5	6·5	165·5
49	..	156	156	2	..	4	7	3	16	..	..	2	3·5	5·5	150·5
50	..	140	140	3	..	1	2	2	8	..	..	·5	1	1·5	138·5
51	2	132	134	4	2	2	3	2	13	1	1	1	1·5	4·5	129·5
52	..	121	121	1	..	3	2	1	7	..	..	1·5	1	2·5	118·5
53	..	114	114	1	..	2	5	2	10	..	..	1	2·5	3·5	110·5
54	3	104	107	7	..	1	1	3	12	1·5	..	·5	·5	2·5	104·5
55	2	95	97	2	..	1	1	2	6	1	..	·5	·5	2	95
56	..	91	91	2	4	1	2	4	13	..	2	·5	1	3·5	87·5
57	1	78	79	..	..	2	..	1	3	·5	..	1	..	1·5	77 5
58	..	76	76	3	2	6	..	2	13	..	1	3	..	4	72
59	1	63	64	..	..	2	2	3	7	·5	..	1	1	2·5	61·5
60	..	57	57	..	..	1	..	5	6	..	..	·5	..	·5	56·5
61	..	51	51	..	1	..	..	2	3	..	·5	..	..	·5	50·5
62	..	48	48	1	..	..	..	4	5	..	..	..	..	..	48
63	..	43	43	2	..	2	..	1	5	..	..	1	..	1	42
64	..	38	38	..	..	2	..	1	3	..	..	1	..	1	37
65	1	35	36	2	2	..	..	2	6	·5	1	..	..	1·5	34·5
66	1	30	31	..	1	..	..	2	3	·5	·5	..	..	1	30
67	..	..	28	..	..	..	..	4	4	..	..	..	..	..	28
68	..	..	24	..	1	..	..	1	2	..	·5	..	..	·5	23·5
69	..	..	22	..	..	..	..	1	1	..	..	..	..	..	22
70	..	..	21	1	..	..	..	2	3	..	..	..	..	..	21
71	..	..	18	..	..	..	..	1	1	..	..	..	..	..	18
72	..	..	17	1	..	..	..	2	3	..	..	..	..	..	17
73	..	..	14	1	..	..	..	1	2	..	..	..	..	..	14
74	..	..	12	..	..	1	..	2	3	..	..	·5	..	·5	11·5
75	..	..	9	..	..	..	..	1	1	..	..	..	..	..	9
76	..	..	8	..	..	..	..	1	1	..	..	..	..	..	8
77	..	..	7	1	..	..	..	2	3	..	..	..	..	..	7
78	..	..	4	1	..	..	..	..	1	..	..	..	..	..	4
79	..	..	3	..	..	..	..	1	1	..	..	..	..	..	3
80	..	..	2	..	..	..	..	1	1	..	..	..	..	..	2
81	..	..	1	..	..	..	..	1	1	..	..	..	..	..	1
82	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
83	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
84	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
85	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	1,340	..	12,113	304	165	228	249	394	1,340	670·0	82·5	114·0	124·5	991·0	11139·0

The first part of the inquiry, made to shew the results connected with the mortality of single life, will be found set forth in the preceding Table, which contains all the facts bearing on the rate of mortality among such members as entered the Society in the single condition, and the observations extending over the period while they remained single. In the event of any member becoming married, all further observation ceases.

The following Abstract C, shews the results arrived at in Table III.

ABSTRACT C.

Ages.	Number Exposed to Risk.	Died.	Mortality per Cent.
20 to 24	1011·0	51	5·045
25 ... 29	2905·0	85	2·926
30 ... 34	2150·5	55	2·558
35 ... 39	1543·0	33	2·138
40 ... 44	1162·0	36	3·099
45 ... 49	858·0	11	1·282
50 ... 54	601·5	16	2·660
55 ... 59	393·5	7	1·779
60 ... 64	234·0	3	1·282
65 ... 69	138·0	2	1·449
70 ... 74	81·5	3	3·681
75 ... 79	31·0	2	6·451
80 ... 84	3·0	...	...
Total...	11112·0	304	2·736

This Abstract shews that the results characteristic of Abstract A are still more strongly developed here; the mortality of early life being higher, that of advanced life lower, and the general mortality even being higher than that of Abstract A. It would hence follow that the elimination of the cases of those who subsequently married has the effect of increasing the general mortality for the residue, as well as increasing the mortality at the early ages and diminishing it at the advanced periods of life. This will be more clearly seen by an inspection of the following figures:—

Ages.	Mortality per Cent. among all those who entered Single. Abstract A.	Mortality per Cent. of those who entered Single, but were excluded from further observation after becoming Married. Abstract C.
20 to 54	2·593	2·805
55 ... 84	2·922	1·918
20 ... 84	2·632	2·736

It is hence evident that the vicissitudes of unmarried life have a more powerful influence on mortality under the age of 55 than above it, compared with the causes connected with the married condition; and further evidence of this will be derived from the following two Abstracts.

In the next Abstract are included such facts only as constitute the complement of Table III, that is, the observations connected with those who have entered the Society while single, but who afterwards married,—the observations commencing from the date of marriage; and therefore the facts in Table III and the following Abstract, constitute the whole of those given in Table I. It has already been shewn that the aggregate mortality of Table III exceeds that of Table I, and therefore the mortality of the next Abstract must fall under that of Table I; but it has also been shewn that the mortality of Table III has, in an eminent degree, portrayed the features characteristic of Table I, and, consequently, Abstract D, following, must be expected to be more uniform, and approximate more nearly to the rate of mortality prevailing in Table II.

ABSTRACT D.

Mortality of those who entered Single, but afterwards Married; the observations commencing at Marriage.

Ages.	Number Exposed to Risk.	Died.	Mortality per Cent.
20 to 24	5·5	...	...
25 ... 29	100·0	3	3·000
30 ... 34	347·5	5	1·439
35 ... 39	521·0	8	1·536
40 ... 44	602·5	3	1·328
45 ... 49	589·0	13	2·207
50 ... 54	523·0	11	2·103
55 ... 59	440·0	12	2·727
60 ... 64	249·5	9	3·607
65 ... 69	121·0	6	4·959
70 ... 74	41·5	5	12·048
75 ... 79	11·5	1	8·070
80 ... 84	1·0	1	100·000
Total...	3553·3	82	2·308

The following shews the condensed results of this Abstract:—

Mortality from ages 20 to 54 = 1·785 per cent.
... ... 55 ... 84 = 3·944 ...
... ... 20 ... 84 = 2·308 ...

Table III, preceding, shewed the rate of mortality among such members as entered single, during the period they continued so, all further observations ceasing after marriage. In the next Abstract will be set forth the rate of mortality among the married members: and it will embrace all the facts of those who entered married, as given in Table II, as well as of those who entered single but afterwards married, the observations commencing at the date of marriage, the facts of which are contained in Abstract D.

Abstract E.

Mortality among Members entered Married, and entered Single but afterwards Married; the Single coming under observation at Marriage.

Ages.	Number Exposed to Risk.	Died.	Mortality per Cent.
25 to 29	184·0	4	2·174
30 ... 34	601·0	6	·998
35 ... 39	972·5	17	1·748
40 ... 44	1192·0	19	1·594
45 ... 49	1271·0	23	1·810
50 ... 54	1186·5	30	2·529
55 ... 59	1006·5	33	3·279
60 ... 64	678·0	23	3·392
65 ... 69	432·5	17	3·931
70 ... 74	201·0	17	8·458
75 ... 79	95·0	10	10·526
80 ... 84	12·0	3	25·000
Total ...	7832·0	202	2·580

In this Abstract the following will be found to represent the general results arrived at:—

Mortality from ages 25—54 = 1·831 per cent.
... ... 55—84 = 4·247 ...
... ... 25—84 = 2·580 ...

The results of this Abstract, as compared with those of Table III and Abstract C, are interesting, as shewing the distinction between the mortality of married and single life. The following gives a condensed illustration of the difference of mortality:—

Ages.	Mortality per Cent. among the Married and Single Members of the Society.	
	Single Members. Abstract C.	Married Members. Abstract E.
25 to 54	2·559	1·831
55 ... 84	1·918	4·247
25 ... 84	2·504	2·580

In this, as in the preceding instances, it is obvious that the characteristic of the mortality of single life is still maintained, the rate of mortality among the unmarried members being greater at the earlier ages, and less at those ages more advanced.

Having thus exhibited the rate of mortality for each of the preceding groups and combinations, it may be now useful to shew the results for the combined experience of all the members, whether married or single. The following Abstract F shews, for each quinquennial term of life, the rate of mortality among all the members of the Society, from its establishment in 1816, till the 1st of January, 1851.

ABSTRACT F.

Mortality among all the Members, Married and Single.

Ages.	Number Exposed to Risk.	Died.	Mortality per Cent.
20 to 24	1016·5	51	5·017
25 ... 29	3089·0	89	2·881
30 ... 34	2751·5	61	2·217
35 ... 39	2515·5	50	1·988
40 ... 44	2354·0	55	2·336
45 ... 49	2129·0	34	1·597
50 ... 54	1788·0	46	2·573
55 ... 59	1400·0	40	2·857
60 ... 64	912·0	26	2·850
65 ... 69	570·5	19	3·330
70 ... 74	282·5	20	7·080
75 ... 79	126·0	12	9·524
80 ... 84	15·0	3	20·000
Total...	18949·5	506	2·670

The condensed results are as follows:—

Mortality between ages 20 to 54 = 2·467 per cent.
... ... 55 ... 84 = 3·629 ...
... ... 20 ... 84 = 2·670 ...

The next Abstract will give a succinct view of the results set forth in each of the preceding six Abstracts, as well as the general mortality at the corresponding ages for the male population of England and Wales, as given in the earlier part of this Volume, pages 4 and 6.

Abstract G.

Ages.	Mortality per Cent.						
	Entered Single. A.	Entered Married. B.	Entered Single, and remaining under observation while Single. C.	Entered Single, but afterwards Married; the observations commencing at Marriage. D.	Entered Married and entered Single; but the Single coming under observation at Marriage. E.	All the Members, Married and Single. F.	Male Population of England and Wales.
20 to 24	5·017	...	5·045	...	...	5·017	·845
25 ... 29	2·928	1·190	2·926	3·000	2·174	2·881	·981
30 ... 34	2·402	·395	2·558	1·439	·998	2·217	1·049
35 ... 39	1·986	1·993	2·138	1·536	1·748	1·988	1·134
40 ... 44	2·494	1·866	3·099	1·328	1·594	2·336	1·279
45 ... 49	1·660	1·466	1·282	2·207	1·820	1·597	1·506
50 ... 54	2·401	2·863	2·660	2·103	2·529	2·573	1·842
55 ... 59	2·280	3·823	1·779	2·727	3·279	2·857	2·393
60 ... 64	2·482	3·267	1·282	3·607	3·392	2·850	3·242
65 ... 69	3·089	3·531	1·449	4·959	3·931	3·330	4·608
70 ... 74	6·553	7·524	3·681	12·048	8·408	7·080	6·686
75 ... 79	7·059	10·778	6·451	8·700	10·526	9·528	10·041
80 ... 84	25·000	18·181	...	100·000	25·000	20·000	15·055
Total...	2·632	2·801	2·736	2·308	2·580	2·670	2·025

The following gives a condensed view of the results arrived at for each of the preceding groups or classes:—

Groups or Classes.	Mortality per Cent. between		
	Ages 25—54.	Ages 55—84.	Ages 25—84.
Abstract A.—Entered single	2·386	2·922	2·454
... B.—Entered married	1·872	4·422	2·801
... C.—Members of Abstract A during *un*married state...	2·559	1·918	2·504
... D.—Members of Abstract A during married state	1·789	3·944	2·312
... E.—Married members	1·831	4·247	2·580
... F.—Both single and married members	2·290	3·629	2·537
Male population of England and Wales	1·166	5·056	1·918

As already stated, each Abstract gives the data and correct rate of mortality for each quinquennial period of life; and the above condensed form of exhibiting the mortality per cent. may, for general purposes, be considered sufficient to illustrate the relative bearing of the different groups; but, at the same time, it is necessary to exercise caution against the employment of those figures or others similarly derived, and extending over any considerable term of life, as giving an exact expression of the true mortality among the different classes compared. The true mortality can only be collected from the details

of each of the preceding Tables, or from the rate of mortality given for each quinquennium in the corresponding Abstracts A, B, C, D, E, and F. The nature of the error contained in the condensed illustrations will be found explained in page 44 *ante.* The conditions necessary to the correct comparison of results derived from observations extending over a considerable term of life, such as between ages 25–54, 55–84, and 25–84, or any other extended periods of life are, that the relative numbers of persons over which the observations are made at the different periods of life should be in exact proportion to each other in the different groups of observations; but should there be in any one group an undue proportion of persons at the younger or older ages, the resulting rate of mortality will become modified accordingly, even although out of equal numbers in each group at different ages the same number of deaths would take place in the same time. Inattention to the errors inherent in such illustrations has often led inquirers to very false conclusions; the method is, however, useful, if employed only for general purposes, and with proper caution. The following figures exhibit the number of years' risk observed on at each term of life.

GROUPS.	Number of Years' Observation at the Term of Life.			
	25 to 54.	Proportion per Cent.	55 to 84.	Proportion per Cent.
Abstract A.—Entered single	11903·0	87·1	1745·5	12·9
... B.—Entered married	2724·0	63·5	1560·5	36·5
... C.—Members of Abstract A during *un*married state ...	9220·0	91·3	881·0	8·7
... D.—Members of Abstract A during married state	2683·0	75·6	864·5	24·4
... E.—Married members	5407·0	69·0	2425·0	31·0
... F.—Both single and married members	14627·0	81·6	3306·0	18·4

It is evident that in some of the above groups there is very great irregularity in the distribution of the number of facts, or years of risk observed at different ages, and hence the rate of mortality per cent. derived from these collected or aggravated results, and which must necessarily be a mean of such irregularly distributed facts, cannot be relied on as shewing the correct relation of the causes of mortality pressing on each class of observations. These remarks apply with greater force to the comparison of the results for the aggregate of all ages, than to the comparative results for either of the extended terms of life, 25–54, or 55–84. It will be seen that in Group C, 91·3 per cent. of the facts are contained between ages 25–54, but in Group B there is only 63·5 per cent. of the observations of that group made between the same ages.

There is another method, however, by which the aggregate mortality of the combined ages may be compared without any error, and that is by comparing the actual number of deaths which has taken place, in each class or group, with that which would have taken place if the rate of mortality had prevailed at each term of life in each group,

which is known to correctly represent the mortality at the same terms of life in any given standard table of mortality with which the results of each group may be compared.

The following shews the number of deaths which have actually taken place in each group, and the number which would have taken place had the same rate of mortality prevailed which is known to represent the mortality of the male population of this country.

ABSTRACT H.

Groups.	Difference between the Mortality which has actually taken place and that which would have happened, according to the ratio for the Male Population of England and Wales, between the following Ages:								
	20—54.			55—84.			20—84.		
	Actual.	England and Wales.	Difference per Cent.	Actual.	England and Wales.	Difference per Cent.	Actual.	England and Wales.	Difference per Cent.
Abstract A. Entered Single	335	151·8	+ 120	51	59·5	— 15	386	211·3	+ 83
,, B. Entered Married	51	38·5	+ 34	69	62·1	+ 11	120	100·6	+ 20
,, C. Members of Abstract A during *un*married state	287	116·0	+ 147	17	32·3	— 47	304	148·3	+ 101
,, D. Members of Abstract A during married state..	48	35·8	+ 33	34	27·2	+ 26	82	63·0	+ 30
,, E. Married Members	99	74·3	+ 33	103	89·3	+ 15	202	163·6	+ 24
,, F. Both Married and Single Members	386	190·3	+ 113	120	121·6	— 1	506	211·9	+ 62

An examination of the above results only confirms the conclusions formerly arrived at; namely, that the members taken in the aggregate under the age of 55 are subject to an unprecedented amount of mortality, but that subsequent to that age the rate of mortality does not differ widely from that of the population generally: as may be more apparent from the following figures taken from the preceding abstract:—

	Actual.		England and Wales.
Number of deaths between the ages 20 to 54 =	386	.....	190·3
... ... 55 ... 84 =	120	.....	121·6
... ... 20 ... 84 =	506	.....	311·9

It is also evident, from the results of the preceding abstract, as well as from those formerly brought under consideration, that the mortality in Group E, which represents the married members, differs very widely from that in Group C, which represents the *un*married.

Period of Life.	Difference per Cent. between the Actual Mortality and that of England and Wales among the	
	Unmarried Group.	Married Group.
Between Ages 20—54	+ 147 per Cent.	+ 33 per Cent.
... ... 55—84	— 47 ...	+ 15 ...
... ... 20—84	+ 101 ...	+ 24 ...

It is thus abundantly evident that the rate of mortality of the married members is so very different from that of the single, that in any calculations intended to measure the duration of life among the married members only, it would not be proper to include the mortality of the single members.

The following Table is formed from the data given in Abstract E, preceding, and represents the mortality for the mean of each quinquennial term of life among the married members of the Society. For a detailed explanation of the principles on which Tables IV and V are constructed, see the subsequent portion of these contributions on the mortality among persons of intemperate habits.

Table IV.

Married Members. Interpolation of Mortality per Cent.

(1) Original Quantities.

Δ_1 and Δ_2 = 1st and 2nd Differences.

$a = \cdot 2\ \Delta_1$

$b = \cdot 04\ \Delta_2$

Age.	(1.)	Δ_1	Δ_2
27	2·174	− 1·176	+ 1·926
		− ·2352 = a	+ ·07704 = b
32	·998	+ ·750	− ·904
		+ ·1500	− ·03616
37	1·748	− ·154	+ ·370
		− ·0308	+ ·01480
42	1·594	+ ·216	·503
		+ ·0432	·02012
47	1·810	·719	+ ·031
		·1438	+ ·00124
52	2·529	·750	− ·637
		·1500	− ·02548
57	3·279	·113	+ ·426
		·0226	+ ·01704
62	3·392	·539	+ 3·988
		·1078	+ ·15952
67	3·931	4·527	− 2·459
		·9054	− ·09836
72	8·458	2·068	+12·406
		·4136	+ ·49624
77	10·526	+ 14·474	
		+ 2·8948	
82	25·000		

The next Table, viewed in connection with the preceding one, shews the mode by which the intermediate terms are determined and interpolated between the original quantities given in Abstract E. For an explanation, more in detail, of the construction of the preceding and the two following Tables, see the subsequent portion of this paper on the "Mortality of Master Mariners."

 [An examination

Table V.

Married Members. Interpolation of Mortality per Cent.

Interval $= \frac{1}{5}$

(1) = Original Quantities.

1st $\delta_1 = a - 2b$.

$\delta_2 = b$.

Age.	(1.)	δ_1	Age.	(1.)	δ_1
27	2·174		47	1·810	
		− ·38928			·14132
28	1·78472		48	1·95132	
		·31224			·14256
29	1·47248		49	2·09388	
		·23520			·14380
30	1·23728		50	2·23768	
		·15816			·14504
31	1·07912		51	2·38272	
		− ·08112			·14628
32	·998		52	2·529	
		+ ·22232			·20096
33	1·22032		53	2·72996	
		·18616			·17548
34	1·40648		54	2·90544	
		·15000			·15000
35	1·55648		55	3·05544	
		·11384			·12452
36	1 67032		56	3·17996	
		+ ·07768			+ ·09904
37	1·748		57	3·279	
		− ·06040			− ·01148
38	1·68760		58	3·26752	
		·04560			+ ·00556
39	1·64200		59	3·27308	
		·03080			·02260
40	1·61120		60	3·29568	
		·01600			·03964
41	1·59520		61	3·33532	
		− ·00120			+ ·05668
42	1·594		62	3·392	
		+ ·00296			− ·21124
43	1·59696		63	3·18076	
		·02308			− ·05172
44	1·62004		64	3·12904	
		·04320			+ ·10780
45	1·66324		65	3·23684	
		·06332			·26732
46	1·72656		66	3·50416	
		·08344			·42684
47	1·810		67	3·931	

TABLE V.—*(continued.)*

Age.	(1).	δ_1	Age.	(1).	δ_1
67	3·931		77	10·526	
		1·10212			1·90232
68	5·03312		78	12·42832	
		1·00376			2·39856
69	6·03688		79	14·82688	
		·90540			2·89480
70	6·94228		80	17·72168	
		·80704			3·39104
71	7·74932		81	21·11272	
		+ ·70868			+3·88728
72	8·458		82	25·000	...
		− ·57888			
73	7·87912		...	...	...
		− ·08264			
74	7·79648		...	...	...
		+ ·41360			
75	8·21008		...	...	...
		·90984			
76	9·11992		...	...	...
		1·40608			

From the results obtained in Table V the following Table of Decrements is derived:—

TABLE VI.

Married Members.

Age.	Mortality per Cent. $= d.$ $1-\frac{d}{100}.$	λl $\lambda\left(1-\frac{d}{100}\right)=c$ $5+\Sigma(c)=\lambda l.$	Number Living $= l.$	Number Dying.	Age.	Mortality per Cent. $= d.$ $1-\frac{d}{100}.$	λl $\lambda\left(1-\frac{d}{100}\right)=c$ $5+\Sigma(c)=\lambda l.$	Number Living $= l.$	Number Dying.
25	2·174	5·00000	100,000	2,175	37	1·748	4·91702	82,608	1,445
	·97826	9·99045				·98252	9·99234		
26	2·174	4·99045	97,825	2,128	38	1·688	·90936	81,163	1,369
	·97826	·99045				·98312	·99261		
27	2·174	·98090	95,697	2,081	39	1·642	·90197	79,794	1,310
	·97826	·99045				·98358	·99281		
28	1·785	·97135	93,616	1,671	40	1·611	·89478	78,484	1,264
	·98215	·99218				·98389	·99295		
29	1·472	·96353	91,945	1,353	41	1·595	·88773	77,220	1,231
	·98528	·99356				·98405	·99302		
30	1·237	·95709	90,592	1,121	42	1·594	·88075	75,987	1,212
	·98763	·99459				·98406	·99302		
31	1·079	·95168	89,471	966	43	1·597	·87377	74,777	1,194
	·98921	·99529				·98403	·99301		
32	·998	·94697	88,505	882	44	1·620	·86678	73,583	1,191
	·99002	·99565				·98380	·99291		
33	1·220	·94262	87,623	1,168	45	1·663	·85969	72,392	1,203
	·98780	·99467				·98337	·99272		
34	1·406	·93729	86,555	1,217	46	1·727	·85241	71,189	1,229
	·98594	·99385				·98273	·99244		
35	1·556	·93114	85,338	1,328	47	1·810	·84485	69,960	1,266
	·98444	·99319				·98190	·99207		
36	1·670	4·92433	84,010	1,402	48	1·951	4·83692	68,694	1,339
	·98330	9·99269				·98049	9·99145		

TABLE VI.—*(continued)*

Age.	Mortality per Cent. $= d.$ $1-\frac{d}{100}$.	λl $\lambda\left(1-\frac{d}{100}\right)=c$ $5+\Sigma(c)=\lambda l.$	Number Living. $= l.$	Number Dying.	Age.	Mortality per Cent. $= d.$ $1-\frac{d}{100}$.	λl $\lambda\left(1-\frac{d}{100}\right)=c$ $5+\Sigma(c)=\lambda l.$	Number Living. $= l.$	Number Dying.
49	2·094	4·82837	67,355	1,410	75	8·210	4·34772	22,270	1,828
	·97906	9·99081				·91790	9·96280		
50	2·238	·81918	65,945	1,476	76	9·120	·31052	20,442	1,864
	·97762	·99017				·90880	·95847		
51	2·383	·80935	64,469	1,537	77	10·526	·26899	18,578	1,956
	·97617	·98952				·89474	·95170		
52	2·529	·79887	62,932	1,593	78	10·924	·22069	16,622	1,816
	·97471	·98887				·89076	·94976		
53	2·730	·78774	61,339	1,674	79	11·896	·17045	14,806	1,761
	·97270	·98798				·88104	·94500		
54	2·905	·77572	59,665	1,733	80	12·889	·11545	13,045	1,681
	·97095	·98720				·87111	·94008		
55	3·055	·76292	57,932	1,770	81	13·972	4·05553	11,364	1,588
	·96945	·98652				·86028	·93464		
56	3·180	·74944	56,162	1,786	82	15·055	3·99017	9,776	1,472
	·96820	·98597				·84945	·92913		
57	3·279	·73541	54,376	1,783	83	16·206	·91930	8,304	1,346
	·96721	·98552				·83794	·92321		
58	3·268	·72093	52,593	1,719	84	17·399	·84251	6,958	1,210
	·96732	·98557				·82601	·91699		
59	3·273	·70650	50,874	1,664	85	18·716	·75950	5,748	1,076
	·96727	·98555				·81284	·91000		
60	3·296	·69205	49,210	1,622	86	20·098	·66950	4,672	939
	·96700	·98545				·79902	·90256		
61	3·335	·67750	47,588	1,587	87	21·777	·57206	3,733	813
	·96665	·98527				·78223	·89333		
62	3·392	·66277	46,001	1,560	88	23·095	·46539	2,920	674
	·96608	·98501				·76905	·88595		
63	3·181	·64778	44,441	1,413	89	24·687	·35134	2,246	555
	·96819	·98597				·75313	·87687		
64	3·129	·63375	43,028	1,347	90	26·277	·22821	1,691	444
	·96871	·98619				·73723	·86760		
65	3·237	·61994	41,681	1,349	91	27·877	3·09581	1,247	348
	·96763	·98571				·72123	·85808		
66	3·504	·60565	40,332	1,412	92	29·528	2·95389	899	265
	·96496	·98452				·70472	·84801		
67	3·931	·59017	38,920	1,530	93	31·127	·80190	634	198
	·96069	·98259				·68873	·83805		
68	5·033	·57276	37,390	1,882	94	32·817	·63995	436	143
	·94967	·97757				·67183	·82726		
69	6·037	·55033	35,508	2,144	95	34·297	·46721	293	100
	·93963	·97295				·65703	·81759		
70	6·942	·52328	33,364	2,316	96	35·572	·28480	193	69
	·93058	·96875				·64428	·80908		
71	7·749	·49203	31,048	2,406	97	36·644	2·09388	124	45
	·92251	·96497				·63356	·80179		
72	8·458	·45700	28,642	2,423	98	37·482	1·89567	79	30
	·91542	·96162				·62518	·79601		
73	7·879	·41862	26,219	2,066	99	38·066	·69168	49	19
	·92121	·96435				·61934	·79163		
74	7·796	4·38297	24,153	1,883	100	38·650	·48361	30	11
	·92204	9·96475				·61350	9·78781		
					101		1·27142	19	7

An examination of the results set forth in column 4 of this Table shews that of the number living at age 25, one-half only will be alive in about thirty-four years afterwards, but in the male population of England and Wales one-half would be alive for forty years afterwards. The following shews the equation of life in the above Table, which represents the mortality of the married members of the Society, and also according to the mortality of the male population of England and Wales.

Ages.	Equation of Life among the	
	Married Members of the Society. Table VI.	Males. England and Wales.
25	34·525	40·309
30	32·453	36·482
40	26·772	28·790
50	20·169	21·255

The next portion of this paper relates to the rate of mortality among the members of the Royal Medical Chirurgical Society, deduced from a list which was furnished to me of all the resident members elected into the Society since its establishment in the year 1805, specifying the date of election, the causes of withdrawal or removal from the Society, or whether they still continue members. This list has been analysed so as to exhibit, in a clear and simple manner, the rate of mortality among the members.

In the first place attention is directed to Table VII, which furnishes a very interesting and succinct view of the changes of the Society, in respect to the election and withdrawal of its members for each year since the commencement. From the second column of this Table it will be seen that, since the year 1805, 684 resident members have been elected, and, by column 5, 96 of these have died, and, according to column 6, 280 have either resigned or, from some cause or other, have ceased to be resident members, so that out of the whole 684 members elected, 376 have now, from various causes, ceased to belong to the Society, leaving, at the period up to which the abstracts were completed, 308 existing members. The other columns of the Table explain themselves, but the point to which attention is now specially directed is that of the rate of mortality amongst the members. The last column shews the rate of mortality, but Abstract I gives a more condensed and convenient view of the results arrived at:—

 [So far

Table VII.

Year of Entry. (1)	Number Entered. (2)	Number under Observation from Year preceding. (3)	Total Number under Observation in each Year. (4)	Died. (5)	Resigned, Ceased to Pay, and Ejected. (6)	Total gone off. (7)	Half of			Number Exposed to Risk of Mortality. (11)	Mortality per Cent. (12)
							Entered. (8)	Discontinued. (9)	Total. (10)		
1805	60	...	60	...	...	...	30	...	30	30	
1806	7	60	67	...	...	...	3·5	...	3·5	63·5	
1807	2	67	69	1 ...	...	...	1	...	1	303 68	0·330
1808	3	69	72	...	1	1	1·5	·5	2	70	
1809	2	71	73	1	1	2	1	·5	1·5	71·5	
1810	9	71	80	...	...	...	4·5	...	4·5	75·5	
1811	8	80	88	...	19	19	4	9·5	13·5	74·5	
1812	9	69	78	...	...	...	4·5	...	4·5	410·5 73·5	0·000
1813	15	78	93	...	1	1	7·5	·5	8	85	
1814	22	92	114	...	2	2	11	1	12	102	
1815	11	112	123	...	7	7	5·5	3·5	9	114	
1816	23	116	139	1	2	3	11·5	1	12·5	126·5	
1817	16	136	152	3 ...	5	5	8	2·5	10·5	710 141·5	0·423
1818	23	147	170	1	4	5	11·5	2	13·5	156·5	
1819	18	165	183	1	5	6	9	2·5	11·5	171·5	
1820	9	177	186	...	6	6	4·5	3	7·5	178·5	
1821	13	180	193	2	9	11	6·5	4·5	11	182	
1822	8	182	190	5 ...	4	4	4	2	6	926 184	0·539
1823	14	186	200	...	9	9	7	4·5	11·5	188·5	
1824	13	191	204	3	9	12	6·5	4·5	11	193	
1825	6	192	198	...	8	8	3	4	7	191	
1826	6	190	196	1	3	4	3	1·5	4·5	191·5	
1827	12	192	204	7 1	10	11	6	5	11	950 193	1·789
1828	13	183	196	...	8	8	6·5	4	10·5	185·5	
1829	8	188	196	5	6	11	4	3	7	189	
1830	6	185	191	1	11	12	3	5·5	8·5	182·5	
1831	...	179	179	7	19	26	...	9·5	9·5	169·5	
1832	3	153	156	21 6	6	12	1·5	3	4·5	795·5 151·5	2·639
1833	5	144	149	2	1	3	2·5	·5	3	146	
1834	5	146	151	5	5	10	2·5	2·5	5	146	
1835	24	141	165	1	2	3	12	1	13	152	
1836	26	162	188	2	3	5	13	1·5	14·5	173·5	
1837	21	183	204	9 ...	4	4	10·5	2	12·5	933 191·5	0·965
1838	11	200	211	3	5	8	5·5	2·5	8	203	
1839	24	203	227	3	4	7	12	2	14	213	
1840	21	220	241	3	7	10	10·5	3·5	14	227	
1841	24	231	255	1	5	6	12	2·5	14·5	240·5	
1842	20	249	269	14 3	4	7	10	2	12	1278·5 257	1·095
1843	24	262	286	5	7	12	12	3·5	15·5	270·5	
1844	30	274	304	2	11	13	15	5·5	20·5	283·5	
1845	20	291	311	7	11	18	10	5·5	15·5	295·5	
1846	24	293	317	6	15	21	12	7·5	19·5	297·5	
1847	29	296	325	26 3	13	16	14·5	6·5	21	1527·5 304	1·702
1848	22	309	331	2	12	14	11	6	17	314	
1849	15	327	332	8	16	24	7·5	8	15·5	316·5	
1850	...	308	...	...	...	...	...	...	...	...	...
	684	...	8,316	96	280	376	342·0	140·0	482·0	7834·0	1·225

ABSTRACT I.

Years.	Number Exposed to Risk.	Died.	Mortality per Cent.
1805 to 1809	303·0	1	0·330
1810 ... 1814	410·5	...	0·000
1815 ... 1819	710·0	3	0·423
1820 ... 1824	926·6	5	0·539
1825 ... 1829	950·0	17	1·789
1830 ... 1834	795·5	21	2·639
1835 ... 1839	933·0	9	0·965
1840 ... 1844	1278·5	14	1·095
1845 ... 1849	1527·5	26	1·702
Total.....	7834·0	96	1·225

So far as these results extend, and considering the limits within which the ages of the members, on admission, must range, it is evident that the mortality of the members is under that of the population of the country generally.

Attention is next requested to Table VIII, which very much resembles Table VII, only that the final column exhibits the ratio of withdrawals from all causes, inclusive of deaths, for each year of the Society's existence. From the following condensed Abstract of this Table, it will be seen that, with the exception of the first quinquennial period of years, there is no very extraordinary fluctuation in the ratio of withdrawals from the general average.

ABSTRACT J.

Year of Entry.	Number Exposed to Risk of Withdrawal.	Total gone off.	Per Centage of Total Withdrawals.
1805 to 1809	304·0	3	0·987
1810 ... 1814	421·5	22	5·219
1815 ... 1819	721·5	26	3·604
1820 ... 1824	944·5	42	4·447
1825 ... 1829	967·5	52	5·375
1830 ... 1834	816·5	63	7·716
1835 ... 1839	942·0	27	2·866
1840 ... 1844	1295·5	48	3·705
1845 ... 1849	1561·0	93	5·951
Total.....	7974·0	376	4·715

It is obvious, however, that Tables VII and VIII give, simply, a chronological view of the Society since its commencement, exhibiting the changes which have taken place in its members during each particular year. It is, however, evident that the more important aspect in which to look at the question is the ratio of withdrawals from the Society, from various causes, during the first, second, and each succeeding year of membership, without regard to the chronological dates of these events. Table IX has, therefore, been constructed [on this

Table VIII.

Year of Entry. (1)	Number Entered (2)	Number under Observation from Year preceding. (3)	Total Number under Observation in each Year. (4)	Died. (5)	Resigned, Ceased to Pay, and Ejected. (6)	Total gone off. (7)	Half of Entered. (8)	Number Exposed to Risk of Withdrawal from the Society from all causes, including Death. (9)	Per Centage of Total Withdrawals. (10)
1805	60	...	60	...	...	...	30	30	
1806	7	60	67	...	...	...	3·5	63·5	
1807	2	67	69	...	...	3	1	68	0·987
1808	3	69	72	...	1	1	1·5	70·5	
1809	2	71	73	1	1	2	1	72	
1810	9	71	80	...	...	...	4·5	75·5	
1811	8	80	88	...	19	19	4	84	
1812	9	69	78	...	...	22	4·5	73·5	5·219
1813	15	78	93	...	1	1	7·5	85·5	
1814	22	92	114	...	2	2	11	103	
1815	11	112	123	...	7	7	5·5	117·5	
1816	23	116	139	1	2	3	11·5	127·5	
1817	16	136	152	...	5	26	8	144	3·604
1818	23	147	170	1	4	5	11·5	158·5	
1819	18	165	183	1	5	6	9	174	
1820	9	177	186	...	6	6	4·5	181·5	
1821	13	180	193	2	9	11	6·5	186·5	
1822	8	182	190	...	4	42	4	186	4·447
1823	14	186	200	...	9	9	7	193	
1824	13	191	204	3	9	12	6·5	197·5	
1825	6	192	198	...	8	8	3	195	
1826	6	190	196	1	3	4	3	193	
1827	12	192	204	11	10	52	21	198	5·375
1828	13	183	196	...	8	8	6·5	189·5	
1829	8	188	196	5	6	11	4	192	
1830	6	185	191	1	11	12	3	188	
1831	...	179	179	7	19	26	...	179	
1832	3	153	156	6	6	63	12	154·5	7·716
1833	5	144	149	2	1	3	2·5	146·5	
1834	5	146	151	5	5	10	2·5	148·5	
1835	24	141	165	1	2	3	12	153	
1836	26	162	188	2	3	5	13	175	
1837	21	183	204	...	4	27	4	193·5	2·866
1838	11	200	211	3	5	8	5·5	205·5	
1839	24	203	227	3	4	7	12	215	
1840	21	220	241	3	7	10	10·5	230·5	
1841	24	231	255	1	5	6	12	243	
1842	20	249	269	3	4	48	7	259	3·705
1843	24	262	286	5	7	12	12	274	
1844	30	274	304	2	11	13	15	289	
1845	20	291	311	7	11	18	10	301	
1846	24	293	317	6	15	21	12	305	
1847	29	296	325	3	13	93	16	310·5	5·951
1848	22	309	331	2	12	14	11	320	
1849	15	327	332	8	16	24	7·5	324·5	
1850	...	308	...	...	...	...	...	...	...
	684	...	8,316	96	280	376	342·0	7974·0	4·715

Table IX.

Rate of Mortality among the Members of the Royal Medical and Chirurgical Society.

Years in the Society. (1)	Number under Observation in each Year. (2)	Died. (3)	Discontinued. Resigned, Ceased to Pay, and Ejected. (4)	Alive. (5)	Total gone off. (6)	Half of Discontinued. (7)	Number Exposed to Risk of Mortality. (8)	Mortality per Cent. (9)
1	684	1	...	15	16	...	342	
2	668	2	10	22	34	5	663	
3	634	9 2	25	25	52	12·5	2198 621·5	0·409
4	582	4	21	19	44	10·5	571·5	
5	538	7	20	12	39	10	528	
6	499	3	25	24	52	12·5	486·5	
7	447	14 1	36	14	51	18	2190·5 429	0·639
8	396	3	15	15	33	7·5	388·5	
9	363	...	9	22	31	4·5	358·5	
10	332	2	13	15	30	6·5	325·5	
11	302	5	6	19	30	3	299	
12	272	20 6	12	6	24	6	1353·5 266	1·477
13	248	2	10	14	26	5	243	
14	222	5	4	11	20	2	220	
15	202	5	11	13	29	5·5	196·5	
16	173	1	8	2	11	4	169	
17	162	11 3	7	3	13	3·5	811·5 158·5	1·355
18	149	...	4	3	7	2	147	
19	142	2	3	...	5	1·5	140·5	
20	137	4	8	2	14	4	133	
21	123	1	4	4	9	2	121	
22	114	8 ...	1	3	4	·5	578·5 113·5	1·383
23	110	3	2	3	8	1	109	
24	102	...	...	1	1	...	102	
25	101	2	2	1	5	1	100	
26	96	6	2	6	14	1	95	
27	82	17 6	1	2	9	·5	410 81·5	4·146
28	73	1	5	2	8	2·5	70·5	
29	65	2	4	2	8	2	63	
30	57	5	2	2	9	1	56	
31	48	...	4	7	11	2	46	
32	37	7 ...	1	4	5	·5	200 36·5	3·500
33	32	1	...	1	2	...	32	
34	30	1	1	1	3	·5	29·5	
35	27	2	...	1	3	...	27	
36	24	4	3	7	14	1·5	22·5	
37	10	6 ...	...	2	2	...	74 10	8·108
38	8	...	1	...	1	·5	7·5	
39	7	...	...	1	1	...	7	
40	6	...	...	1	1	...	6	
41	5	1	...	...	1	...	5	
42	4	4 1	...	1	2	...	18 4	22·222
43	2	1	...	...	1	...	2	
44	1	1	...	...	1	...	1	
	8,316	96	280	308	684	140·0	7834·0	1·225

on this hypothesis; the first column shews the years of membership, the second column shews the number of members who have been one, two, three, four, &c., years connected with the Society, and the other columns sufficiently explain themselves. It thus appears that of the 684 members elected, *one* died in the first year of membership, and 15 still remain alive, being in the first year of membership. Again, 668 entered on the second year of membership, two died in that year, 10 withdrew from other causes, and 22 are alive who are members of not more than two years' standing. Also four entered on the forty-second year of their membership, one died in that year, and one of them remains alive, being a member of forty-two years' standing. Likewise of the two members who entered on the forty-third year of membership, one died in that year, and the other passed on to the forty-fourth year of membership, and died. It hence appears that the whole 684 members elected have, up to the present time, passed through 8,316 years of observation, or about 12 years to each member; but this must not be confounded with the average period of membership, for the above result is derived from observations on a large number but recently elected; the correct average duration of membership will hereafter appear. The average rate of mortality in this Table will be found to coincide with that of Table VII being 1·225 per cent., but an inspection of the last column shews that as the period of membership increases, or, in other words, as age advances, there is a marked increase in the rate of mortality. The following is a brief Abstract of the results in Table IX.

ABSTRACT K.

Years in the Society.	Number Exposed to Risk of Mortality.	Died.	Mortality per Cent.
1 to 4	2198	9	0·409
5 ... 9	2190·5	14	0·639
10 ... 14	1353·5	20	1·477
15 ... 19	811·5	11	1·355
20 ... 24	578·5	8	1·383
25 ... 29	410	17	4·146
30 ... 34	200	7	3·500
35 ... 39	74	6	8·108
40 ... 44	18	4	22·222
Total.....	7834	96	1·225

Assuming that the average age of admission of members will range from 25 to 35 years of age, although, perhaps, it may be more strictly stated to range between 25 and 30, an inspection of the above figures will shew that at the younger ages the mortality is much less than the average of the population generally, but at the older and more advanced ages greater.

The next Table, X, is similar in arrangement to Table IX, only shewing in the final column, instead of the rate of mortality, the ratio per cent., as in Table VIII, of withdrawals from the Society from all causes, including death, and here, as in the preceding Table, the causes of withdrawal will be found to increase with the period of membership.

[The following

Table X.

Duration of Membership in the Royal Medical and Chirurgical Society.

Years in the Society. (1)	Number under Observation in each Year. (2)	Died. (3)	Resigned Ceased to Pay, and Ejected. (4)	Total. (5)	Alive. (6)	Total gone off. (7)	Number Exposed to Risk of Withdrawal from the Society from all causes, including Death. (8)	Per Centage of Total Withdrawals. (9)
1	684	1	...	1	15	16	342	
2	668	2	10	12	22	34	668	
3	634	2	25	65 27	25	52	2,226 634	2·920
4	582	4	21	25	19	44	582	
5	538	7	20	27	12	39	538	
6	499	3	25	28	24	52	499	
7	447	1	36	119 37	14	51	2,243 447	5·305
8	396	3	15	18	15	33	396	
9	363	...	9	9	22	31	363	
10	332	2	13	15	15	30	332	
11	302	5	6	11	19	30	302	
12	272	6	12	65 18	6	24	1,376 272	4·724
13	248	2	10	12	14	26	248	
14	222	5	4	9	11	20	222	
15	202	5	11	16	13	29	202	
16	173	1	8	9	2	11	173	
17	162	3	7	44 10	3	13	828 162	5·314
18	149	...	4	4	3	7	149	
19	142	2	3	5	...	5	142	
20	137	4	8	12	2	14	137	
21	123	1	4	5	4	9	123	
22	114	...	1	23 1	3	4	586 114	3·925
23	110	3	2	5	3	8	110	
24	102	...	...	...	1	1	102	
25	101	2	2	4	1	5	101	
26	96	6	2	8	6	14	96	
27	82	6	1	31 7	2	9	417 82	7·434
28	73	1	5	6	2	8	73	
29	65	2	4	6	2	8	65	
30	57	5	2	7	2	9	57	
31	48	...	4	4	7	11	48	
32	37	...	1	15 1	4	5	204 37	7·353
33	32	1	...	1	1	2	32	
34	30	1	1	2	1	3	30	
35	27	2	...	2	1	3	27	
36	24	4	3	7	7	14	24	
37	10	...	...	10 ...	2	2	76 10	13·158
38	8	...	1	1	...	1	8	
39	7	...	...	...	1	1	7	
40	6	...	...	...	1	1	6	
41	5	1	...	1	...	1	5	
42	4	1	...	4 1	1	2	18 4	22·222
43	2	1	...	1	...	1	2	
44	1	1	...	1	...	1	1	
	8,316	96	280	376	308	684	7,974	4·715

The following is a condensed abstract of Table X:—

ABSTRACT L.

Years in the Society.	Number Exposed to Risk of Withdrawal.	Died, Resigned, Ceased to Pay, and Ejected.	Per Centage of Total Withdrawals.
1 to 4	2,226	65	2·920
5 ... 9	2,243	119	5·305
10 ... 14	1,376	65	4·724
15 ... 19	828	44	5·314
20 ... 24	586	23	3·925
25 ... 29	417	31	7·434
30 ... 34	204	15	7·353
35 ... 39	76	10	13·158
40 ... 44	18	4	22·222
Total.....	7,974	376	4·715

From the results of this Abstract, Table XI has been constructed so as to exhibit in an interesting manner the average duration of membership as deduced from the experience of the Royal Medical Chirurgical Society, from its establishment, in the year 1805, up to the present time.

This Table has been constructed from the results set forth in the last column of Abstract L, in the same manner in which Table VI, preceding, was constructed from the figures given in Abstract E, only that, in the former case, third differences were used in the interpolations, but in the later instances, second differences only, see the subsequent portion of these contributions on the Mortality of Master Mariners.

Assuming that 100,000 members, or any submultiple by ten of that number, entered the Society, column 4 will shew the numbers remaining in the Society in each succeeding year, and column 5 will shew the number of members withdrawing from all causes. Hence, of 100,000 members, 1920 would withdraw in the first year of membership, or of 1000 entering, 19 would withdraw. Again, of 1000 members elected into the Society, 516 would enter on the fifteenth year of membership, and 486 on their sixteenth year, or, in other words, the equation of membership, or what is technically of almost the same value for the present purpose, the expectation of membership when just elected is about fifteen and a half years. If the experience of this Society can be taken as any criterion of that of other learned societies, this result deduced from the preceding Table would be of some practical importance in the regulation of the composition-money required in lieu of the annual subscriptions paid by members. Keeping in view the fact that the expectation of membership is about fifteen years, it is easy to determine the present value of a corresponding annuity. By the term "present value," is meant the single sum of money

[which paid

Table XI.

Decrements of Membership in the Royal Medical and Chirurgical Society of London.

Years.	Per Centage $= d.$	λl $d + \Sigma(c) = \lambda l.$ $\lambda\left(1 - \frac{d}{100}\right) = c$	Number of Members in the Society at the beginning of each Year from the Date of Admission $= l.$	Decrements $= \delta.$	Years.	Per Centage $= d.$	λl $d + \Sigma(c) = \lambda l.$ $\lambda\left(1 - \frac{d}{100}\right) = c$	Number of Members in the Society at the beginning of each Year from the Date of Admission $= l.$	Decrements $= \delta.$
		5·0000000	100,000	1,920			4·5575004	36,099	1,416
1	1·920	9·9915835			22	3·925	9·9826104		
		4·9915805	98,080	2,864			·5401108	34,683	1,863
2	2·920	·9871298			23	5·369	·9760334		
		·9787103	95,216	3,650			·5161442	32,820	2,089
3	3·833	·9830261			24	6·366	·9714336		
		·9617364	91,566	4,115			·4875778	30,731	2,149
4	4·495	·9800261			25	6·992	·9685203		
		·9417625	87,451	4,320			·4560981	28,582	2,093
5	4·939	·9780024			26	7·323	·9669720		
		·9197649	83,131	4,321			·4230701	26,489	1,969
6	5·198	·9768175			27	7·434	·9664515		
		·8965824	78,810	4,181			·3895216	24,520	1,734
7	5·305	·9763270			28	7·073	·9681419		
		·8729094	74,629	3,915			·3576635	22,786	1,564
8	5·246	·9765976			29	6·863	·9691222		
		·8495070	70,714	3,630			·3267857	21,222	1,449
9	5·134	·9771106			30	6·826	·9692947		
		·8266176	67,084	3,349			·2960804	19,773	1,380
10	4·992	·9777602			31	6·982	·9685670		
		·8043778	63,735	3,089			·2646474	18,393	1,353
11	4·847	·9784225			32	7·353	·9668314		
		·7828003	60,646	2,865			·2314788	17,040	1,319
12	4·724	·9789835			33	7·740	·9650135		
		·7617838	57,781	3,080			·1964923	15,721	1,326
13	5·330	·9762124			34	8·438	·9617153		
		·7379962	54,701	3,084			·1582076	14,395	1,341
14	5·638	·9747971			35	9·523	·9575382		
		·7127933	51,617	2,943			·1157458	13,054	1,445
15	5·701	·9745071			36	11·071	·9490434		
		·6873004	48,674	2,713			·0647892	11,609	1,528
16	5·574	·9750916			37	13·158	·9387298		
		·6623920	45,961	2,442			·0035190	10,081	1,474
17	5·314	·9762858			38	14·626	·9313256		
		·6386778	43,519	2,202			3·9348446	8,607	1,398
18	5·060	·9774492			39	16·244	·9230159		
		·6161270	41,317	1,953			·8578605	7,209	1,300
19	4·727	·9789698			40	18·036	·9136231		
		·5950968	39,364	1,725			·7714836	5,909	1,183
20	4·381	·9805442			41	20·020	·9029814		
		4·5756410	37,639	1,540			·6744650	4,726	1,050
21	4·091	9·9818594			42	22·222	9·8908568		
							3·5653218	3,676	908

which paid down, would, if invested at the same rate of interest as the annual subscriptions, meet precisely the same liabilities as they fall due. Assuming that the funds or composition paid in commutation of yearly subscriptions could be invested to yield 3 per cent. compound interest, the present value of the annuity equivalent to that dependent on the expectation of membership is about eleven years' purchase. But there is another view to be taken of this question. If the practice of receiving composition payments were permitted and generally adopted by the members, there can be no doubt that the withdrawals from the Society from other causes than death, or those specified in column 4 of Table D, would be very much reduced. Different societies will, no doubt, be variously affected by these causes, and this feature of Tables VII, VIII, IX, and X, has been introduced here principally in order to direct more general attention to the question.

It is, however, very curious and instructive to observe the rate of mortality developed in some of these latter Tables, and particularly in Table IX and Abstract K, as compared with the rate of mortality found to prevail among the medical officers of the Royal Army. The difference is certainly one of the most remarkable results yet deduced by any inquiry into Vital Statistics.

The following Abstract M shews that throughout the period of life 26–70, the mortality among the members of the Royal Medical and Chirurgical Society approximates very closely to that of the male population of England and Wales, being considerably less between ages 26–35, somewhat higher above 35 years of age, but in the whole term of life, varying from 26 to 70 years of age, the mortality differs but little: the actual number of deaths in the Society being 96, while that which would have taken place according to the mortality of England and Wales is 97·1.

Abstract M.

Mortality among the Members of the Royal Medical and Chirurgical Society.

Age.	Number Exposed to Risk.	Mortality per Cent.	Deaths.		England and Wales.		
			At each Term of Life.	Total.	Mortality per Cent.	Deaths that would have happened at each Term of Life.	Total.
26 to 30	2198·0	0·409	9	...	0·998	21·9	...
31 ... 35	2190·5	0·639	14	23	1·063	23·3	45·2
36 ... 40	1353·5	1·477	20	43	1·157	15·7	60·9
41 ... 45	811·5	1·355	11	54	1·319	10·7	71·6
46 ... 50	578·5	1·383	8	62	1·560	9·0	80·6
51 ... 55	410·0	4·146	17	79	1·935	7·9	88·5
56 ... 60	200·0	3·500	7	86	2·529	5·1	93·6
61 ... 65	74·0	8·108	6	92	3·474	2·6	96·2
66 ... 70	18·0	2·222	4	96	4·947	0·9	97·1
	7834·0	1·225	96	...	1·239	97·1	...

In vol. ix. of the Journal of this Society will be found an interesting paper by Dr. Guy, "On the Duration of Life in several Professions," distinguishing, among others, the Medical Profession. The results arrived at by Dr. Guy shew a somewhat greater mortality than that for the male population generally of this country. In vol. xvii. of the same Journal will be found another paper by Dr. Guy, "On the Duration of Life among Medical Men," founded on a larger body of facts. The results of his second inquiry however agree closely with those of the first, considering the nature of the data and the mode of investigation followed. There is also before the public the well-known body of facts collected by Professor Casper, of Berlin, and which exhibits a higher rate of mortality than even the results of Dr. Guy's paper; but it is only right to bear in mind that, however valuable these contributions may be considered, both collections of facts are defective in one very important element, namely, the number of medical men in the profession or class in which the deaths are recorded. Neither Dr. Guy nor Professor Casper had the means of ascertaining the amount of population in the respective groups in which the deaths recorded took place; but, under the circumstances, they have made the best possible use of the materials at their command. In the facts brought forward in this paper, however, it will be seen that the number of the living, both in the officers of the Medical Department of the Royal Army and among the members of the Royal Medical Chirurgical Society, is known, and therefore all the elements necessary to a complete inquiry into the duration of life in each of these classes are available. It could also be easily shewn that the effect of introducing the wanting element in Dr. Guy's inquiry would be to increase the duration of life assigned to the results he has arrived at, and thereby make the rate of mortality approximate more closely to those set forth in Abstracts K and M, preceding.

It is very satisfactory to find so near an agreement in the results of two independent inquiries, originating in so different a manner, and resting on so very different sources of information. But this coincidence only makes the results of the investigation into the duration of life among the officers of the Medical Department of the Army, as brought forward in the early part of this paper, the more remarkable and extraordinary.

It will be observed, that although a very complete analysis has been made of the social condition of life of the medical officers of the Royal Army, in order to arrive at the rate of mortality peculiar to those conditions, still no attempt has been made to determine the physical causes which it is evident prevail so powerfully in producing differences of mortality of so striking a nature as to be wholly without precedent in all former inquiries in the diversified field of Vital Statistics. It is proposed to reserve this more generally interesting part of the investigation for a future occasion.

It may, however, be now stated that the very high rate of mortality under the age of 54, but more particularly under the age of 40, as indicated by the results in all the Abstracts from A to F inclusive, had, in the first place, been supposed to arise from the

younger medical officers being probably sent to unhealthy stations. In order to test the merits of this hypothesis, an examination was permitted to be made of the records at the War-office, to determine the place of death; but of the 506 deaths given in Tables I and II, the place was found specified for only 308, and the following is a condensed Abstract of the results of this part of the inquiry.

Abstract N.

Places at which 308 *Members of the Royal Army Medical Fund have died, distinguishing the Age at time of Death.*

Place of Death.	Age at Death.													Total.		
	20 to 24	25 .. 29	30 .. 34	35 .. 39	40 .. 44	45 .. 49	50 .. 54	55 .. 59	60 .. 64	65 .. 69	70 .. 74	75 .. 79	80 .. 84	To Age 40.	To Age 55.	To Age 84.
Great Britain and Ireland	7	18	9	10	15	11	16	8	9	6	4	2	2	44	86	117
Healthy Colonies	6	12	11	11	4	5	6	6	7	3	..	..	..	40	55	71
Total.....	13	30	20	21	19	16	22	14	16	9	4	2	2	84	141	188
The West Indies	7	14	9	8	6	6	1	2	..	..	1	..	..	38	51	54
The East Indies	3	13	14	5	7	1	3	4	2	..	..	..	..	35	46	52
Africa.....	5	4	4	..	1	..	..	..	..	..	..	..	..	13	14	14
Total.....	15	31	27	13	14	7	4	6	2	..	1	..	..	86	111	120
Grand Total....	28	61	47	34	33	23	26	20	18	9	5	2	2	170	252	308

An inspection of the figures in this Abstract, will at once shew that the number of deaths which has taken place in unhealthy colonies, is not sufficient to account for the unprecedented amount of mortality under age 40. If the whole of the deaths in the three last groups of the preceding Abstract were excluded, the mortality assigned to the first and second groups would still be greatly in excess of that which under ordinary circumstances is experienced in this country, and other equally healthy places; in fact,

under the age of 35, the rate of mortality would, even after the elimination of the second section of Abstract N, be at least double that of the male population of England and Wales at the corresponding ages. On referring to the Abstract given in page 106, it will be seen that, even assuming the whole of the younger officers to have been constantly resident in India or in other equally trying climates, it would not be sufficient to account for the large number of deaths which has actually taken place. The extraordinary results appearing in this paper, cannot therefore be explained by the supposed influence of climate or residence in unhealthy colonies; and it is somewhat remarkable, that in the very able statistical reports prepared from the records of the Army Medical Department, and the War-office returns, no notice should be taken of facts so seriously affecting the medical officers of the service, and so much demanding inquiry and investigation.

MORTALITY OF MASTER MARINERS.

The present contribution is brought under attention with the view of increasing our knowledge of the causes which affect the mortality of Master Mariners. Apart from the scientific considerations connected with this question as a branch of Vital Statistics, it is believed that its discussion will receive additional interest from the immediate and direct application of the results to the purposes of Life Assurance Institutions.

The first portion of the following materials has been collected from the records of the "Master Mariners' Society," enrolled under the Friendly Societies' Acts, and includes the experience of the Society for the fourteen years, 1835-48. The members consist exclusively of master mariners, and previous to admission, their health and habits undergo the scrutiny usually exercised by life offices and friendly societies. The benefits granted are of a twofold nature, the payments of specified sums of money on the death of the members, and a fixed rate of compensation in the event of the wreck or partial wreck of their vessels. The registers of the Society have been very accurately kept, and the following facts have been abstracted with great care by the secretary, on a schedule prepared for the purpose, and have been at three different times compared with the original books and examined by him, so that proper means have been taken to ensure accuracy.

The facts furnished by the secretary were then re-abstracted into other schedules in the following manner.

First. All the members entering the Society in each year were distinguished and placed in separate groups according to their ages on admission, and the subsequent contingencies to be observed were, with their dates, duly noted; in the event of the death of a member, the peculiar form and manner of death, and in the event of the wreck or injury of a vessel, the particulars were always noted, and those members who did not fall under any of the causes of death, or withdrawal from the Society, were in like manner noted. The summary, therefore, of this schedule shewed for the members entering in every year of the Society's existence, and for members of different ages, the results peculiar to each, and offered interesting means of comparison, and were therefore so collected into a second schedule, the summary of which shewed, irrespective of the period of admission, the casualties of different kinds happening at each term of life. The details of these schedules occupy so much space, that it is not proposed to bring them forward here, but at once to proceed to the following Table, No. I, on which they were

finally abstracted. The following notes will be sufficient to explain the construction of this Table.

Column (*a*) Represents the age at which the admission of each member, or other contingent event connected therewith, took place.

(*b*) The number of members admitted at each age.

(*c*) The number of members remaining under observation from each preceding age, and is the residue of all those entering in each preceding age, who have not become subject to any of the contingent events represented in the adjoining columns. For example, one member enters at the age of 19, and not falling under the events specified in the adjoining columns, he survives until the succeeding age, and comes under observation as a member of the age of 20.

(*d*) Again, two members enter at the age of 20, which, with the one remaining from the age of 19, make three, coming under observation at some time or other after completing the 19th year of their life, and before completing the 20th year, none of these become subject to any of the other events specified, and the whole three are therefore carried under observation to the following age, 21, when 15 other members entered, making 18 altogether under observation at the age of 21. Of these, one, recently entered, remains alive on the 31st December, 1848, and therefore passes from under observation at the age of 21, and consequently 17 only come under observation in the next year; but at the age of 22, there are 28 members more admitted, which, added to 17, causes 45 to fall under observation in the 22nd year of life. In like manner, 77 members in all come under observation at the age of 23. Of these, one is lost during the course of that year, and one retires, while one, who has recently entered, remains alive on the 31st December, 1848, and is, therefore, not longer observed; three members in all, therefore, go from under observation at the age of 23, and 74 are carried forward to the succeeding age of 24, which, with 43 admitted at that age, brings 117 members altogether under review at the age of 24.

(*e*) Represents the numbers dying at each age or term of life from natural causes.

(*f* to *k*), inclusive, Represent the numbers dying at each age or term of life from other causes.

(*l*) Shews the total of columns *e* to *k*, inclusive.

(*m*, *n*, *o*) Shew the wrecks and loss of property.

(*p*) Represents those who have retired under the prescribed regulations.

(*q*) Represents the number of members alive on the 31st December, 1848, and who have not become subject to any of the contingent events represented in columns *e* to *k*, inclusive, and also in *p*.

(*r*) Contains the total of columns *l*, *p*, and *q*, and represents the number of members which cease to come under observation in any of the more advanced ages. For example, at the age of 25, column *d* represents 169 coming under observation; but before attaining the 26th year of age, six of these pass from observation, leaving 163 to come under the 26th year of age, as shewn in column *c*.

(*s*) Represents one half of the numbers entering the Society at each year of life at which admissions take place, and is, therefore, one half of the numbers in column *b*. In like manner, column

(*t*) Represents one half the numbers in column *p*; and column

(*u*) The total of columns *s* and *t*; the purpose of these three colnmns will appear in the explanation of column

(*v*) Which represents the number of lives exposed a complete year to the risk of mortality from all causes while connected with the Society, and the figures in this column are produced by subtracting

[from the

Table I.

Mortality from all Causes.

Age.	Number Entered at each Age.	Number remaining under Observation from Age preceding.	Total Number under Observation at each Age.	Deaths.							Wrecks.			Retired.	Alive.	Total gone off.	Half Entered and Half Discontinued.			Number Exposed to Risk.
				Died.	Lost.	Violent Deaths.	Drowned.	Washed overboard.	Hung himself.	Total.	Wrecked.	Partial Wreck.	Fire.				Entered.	Discontinued.	Total.	
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*k*	*l*	*m*	*n*	*o*	*p*	*q*	*r*	*s*	*t*	*u*	*v*
19	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	·5	...	·5	·5
20	2	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	2
21	15	3	18	...	...	...	...	...	...	...	...	...	...	...	1	1	7·5	...	7·5	10·5
22	28	17	45	...	...	...	...	...	...	...	...	...	...	...	...	...	14	...	14	31
23	32	45	77	...	1	...	...	...	...	1	1	1	...	1	1	3	16	·5	16·5	60·5
24	43	74	117	1	2	...	...	...	...	3	5	1	...	1	3	7	21·5	·5	22	95
25	59	110	169	1	1	...	...	...	...	2	3	2	...	3	1	6	29·5	1·5	31	138
26	64	163	227	1	2	...	2	2	...	7	5	...	1	3	6	16	32	1·5	33·5	193·5
27	57	211	268	2	...	...	...	...	...	2	3	2	...	6	9	17	28·5	3	31·5	236·5
28	66	251	317	4	2	...	...	...	...	6	6	4	...	7	5	18	33	3·5	36·5	280·5
29	60	299	359	5	3	...	...	...	...	8	4	2	...	9	11	28	30	4·5	34·5	324·5
30	88	331	419	4	3	...	1	...	...	8	5	7	...	10	12	30	44	5	49	370
31	54	389	443	2	2	1	1	...	...	6	8	5	..	9	28	43	27	4·5	31·5	411·5
32	64	400	464	7	2	...	1	3	...	13	11	...	...	12	41	66	32	6	38	426
33	65	398	463	11	...	...	1	...	...	12	7	6	...	13	37	62	32·5	6·5	39	424
34	93	401	494	4	4	...	1	...	...	9	9	1	...	7	25	41	46·5	3·5	50	444
35	77	453	530	5	7	...	1	...	...	13	14	4	1	5	38	56	38·5	2·5	41	489
36	63	474	537	2	2	1	1	1	...	7	12	3	...	15	33	55	31·5	7·5	39	498
37	59	482	541	7	1	...	...	...	...	8	10	5	...	11	57	76	29·5	5·5	35	506
38	77	465	542	11	2	1	1	...	...	15	14	...	...	8	41	64	38·5	4	42·5	499·5
39	70	478	548	6	1	...	2	...	...	9	9	3	...	10	35	54	35	5	40	508
40	58	494	552	6	6	1	2	3	...	18	12	5	...	9	44	71	29	4·5	33·5	518·5
41	42	481	523	6	3	1	...	1	...	11	7	9	...	11	47	69	21	5·5	26·5	496·5
42	33	454	487	10	...	...	1	...	...	11	6	2	...	11	51	73	16·5	5·5	22	465
43	46	414	460	9	7	...	1	...	...	7	8	3	...	7	47	71	23	3·5	26·5	433·5
44	44	389	433	6	1	...	...	...	...	7	11	3	...	...	43	50	22	...	22	411
45	24	383	407	3	...	...	2	1	...	6	3	...	...	10	43	59	12	5	17	390
46	15	348	363	9	1	...	1	...	...	11	6	5	1	5	42	58	7·5	2·5	10	353
47	24	305	329	3	1	...	1	...	...	5	2	4	...	9	54	68	12	4·5	16·5	312·5
48	28	261	289	7	2	...	...	...	...	9	6	...	...	8	44	61	14	4	18	271
49	28	228	256	5	1	1	1	...	...	8	2	1	...	2	36	46	14	1	15	241
50	13	210	223	6	3	1	...	...	1	11	2	4	...	7	29	47	6·5	3·5	10	213
51	4	176	180	3	...	...	1	...	...	4	6	1	...	5	21	30	2	2·5	4·5	175·5
52	12	150	162	5	2	...	1	...	...	8	6	2	...	5	25	38	6	2·5	8·5	153·5
53	15	124	139	1	...	...	...	...	...	1	3	1	1	7	13	21	7·5	3·5	11	128
54	11	118	129	...	...	...	...	1	...	1	3	...	...	2	18	21	5·5	1	6·5	122·5
55	5	108	113	7	...	...	...	...	...	7	...	2	1	4	14	25	2·5	2	4·5	108·5
56	4	88	92	1	...	...	...	...	...	1	1	...	...	4	10	15	2	2	4	88
57	...	77	77	1	...	...	...	...	...	1	1	...	...	4	12	17	...	2	2	75
58	3	60	63	1	...	...	...	...	...	1	...	1	...	2	8	11	1·5	1	2·5	60·5
59	...	52	52	1	...	...	...	...	...	1	...	...	...	1	11	13	...	·5	·5	51·5
60	...	...	39	2	...	...	...	...	...	2	1	1	...	...	12	14	...	...	...	39
61	...	...	25	...	...	...	...	...	...	...	...	...	...	...	3	3	...	...	...	25
62	...	...	22	...	...	...	...	...	...	...	1	...	...	...	5	5	...	...	...	22
63	...	...	17	...	...	...	...	...	...	...	...	...	..	1	3	4	...	·5	·5	16·5
64	...	...	13	...	...	...	...	...	...	...	...	...	...	...	5	5	...	...	...	13
65	...	...	8	...	...	...	...	...	...	...	...	...	...	1	3	4	...	·5	·5	7·5
66	...	...	4	...	...	...	...	...	...	...	...	...	...	...	2	2	...	...	...	4
67	...	...	2	...	...	...	...	...	...	...	...	...	...	...	2	2	...	...	...	2
68	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	1,546		12,041	165	62	7	23	12	1	270	213	90	5	254	1,031	1,546	773·0	122·5	895·5	11145·5

from the numbers in column *d* the numbers in column *u*, opposite the same age. As already stated, column *d* contains the gross number under observation at some time or other throughout the year of life set forth in column *a*; but as column *b* contains for each age the numbers who have just entered the Society, and as members, one with another, enter at different periods throughout the year, it has been found, by observation, that, on an average, each is during the year of admission, exposed to only six months', or one half-year's mortality, and hence column *s* represents that amount of risk for all the members just admitted. In like manner, column *t* represents the amount of risk to which members retiring from the Society are exposed, on the hypothesis that, one with another, the discontinuances will take place in the middle of the year. It thus appears, that as column *u* is the total of *s* and *t*, that it shews the proper number to be deducted from the quantities in column *d*, in order to find the number exposed to the risk of a whole year's mortality.

From this Table, it will be seen that of 270 deaths, 165 only have taken place from natural causes, 62 were lost with their vessels, seven took place by violent means, such as falling of masts, and loss of life in engagements with pirates, 23 were drowned, 12 washed overboard, and one hung himself.

The following is a condensed Abstract of this Table, and represents the rate of mortality from all causes taking place among master mariners, at different periods of life.

ABSTRACT A.

Age.	Number exposed to the Risk of Mortality from all causes.	Died.	Mortality per Cent.
19 to 20	2·5	...	...
21 ... 25	335·0	6	1·791
26 ... 30	1,405·0	31	2·206
31 ... 35	2,194·5	53	2·415
36 ... 40	2,530·0	57	2·253
41 ... 45	2,196·0	52	2·368
46 ... 50	1,390·5	44	3·164
51 ... 55	688·0	21	3·052
56 ... 60	314·0	6	1·911
61 ... 65	84·0	...	...
66 ... 68	6·0	...	...
Total.....	11,145·5	270	2·423

It will thus be seen that throughout the Table the rate of mortality is high; and attention is next directed to Table II, which exhibits the mortality that has taken place from natural causes only. In this Table, it will be observed that columns *a* to *e* inclusive, are exactly similar to the first five columns of Table I, but that the group of columns headed "discontinued," in Table II, consists of columns *f*, *g*, *h*, *i*, and *k*, of Table I, with the addition of *p*. The reason of this will immediately appear on reflection. In Table I,

[the mortality

Table II.

Mortality from Natural Causes.

Age.	Number Entered at each Age.	Number remaining under Observation from Age preceding.	Total Number under Observation at each Age.	Died.	Discontinued.							Alive.	Total gone off.	Half Entered and Half Discontinued.			Number Exposed to Risk.
					Lost.	Violent Death.	Drowned.	Washed overboard.	Hung himself.	Retired.	Total.			Entered.	Discontinued.	Total.	
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*k*	*l*	*m*	*n*	*o*	*p*	*q*	*r*	*s*
19	1	..	1	..	..	..	..	..	..	..	..	..	..	·5	..	·5	·5
20	2	1	3	..	..	..	..	..	..	..	..	..	..	1	..	1	2
21	15	3	18	..	..	..	..	..	..	..	..	1	1	7·5	..	7·5	10 5
22	28	17	45	..	..	..	..	..	..	..	..	..	..	14	..	14	31
23	32	45	77	..	1	..	..	..	..	1	2	1	3	16	1	17	60
24	43	74	117	1	2	..	..	..	..	1	3	3	7	21·5	1·5	23	94
25	59	110	169	1	1	..	..	..	..	3	4	1	6	29·5	2	31·5	137·5
26	64	163	226	1	2	..	2	2	..	3	9	6	16	32	4·5	36·5	190·5
27	57	211	268	2	..	..	..	..	..	6	6	9	17	28·5	3	31·5	236·5
28	66	251	317	4	2	..	..	..	..	7	9	5	18	33	4·5	37·5	279·5
29	60	299	359	5	3	..	..	..	..	9	12	11	28	30	6	36	323
30	88	331	419	4	3	..	1	..	..	10	14	12	30	44	7	51	368
31	54	389	443	2	2	1	1	..	..	9	13	28	43	27	6·5	33·5	409·5
32	64	400	464	7	2	..	1	3	..	12	18	41	66	32	9	41	423
33	65	398	463	11	..	..	1	..	..	13	14	37	62	32·5	7	39·5	423·5
34	93	401	494	4	4	..	1	..	..	7	12	25	41	46 5	6	52·5	441·5
35	77	453	530	5	7	..	1	..	..	5	13	38	56	38·5	6·5	45	485
36	63	474	537	2	2	1	1	1	..	15	20	33	55	31·5	10	41·5	495·5
37	59	482	541	7	1	..	..	..	..	11	12	57	76	29·5	6	35·5	505·5
38	77	465	542	11	2	1	1	..	..	8	12	41	64	38·5	6	44·5	497·5
39	70	478	548	6	1	..	2	..	..	10	13	35	54	35	6·5	41·5	506·5
40	58	494	552	6	6	1	2	3	..	9	21	44	71	29	10·5	39·5	512·5
41	42	481	523	6	3	1	..	1	..	11	16	47	69	21	8	29	494
42	33	454	487	10	..	..	1	..	..	11	12	51	73	16·5	6	22 5	464·5
43	46	414	460	9	7	..	1	..	..	7	15	47	71	23	7·5	30·5	420·5
44	44	389	433	6	1	..	..	..	..	..	1	43	50	22	·5	22·5	410·5
45	24	383	407	3	..	..	2	1	..	10	13	43	59	12	6·5	18·5	388·5
46	15	348	363	9	1	..	1	..	..	5	7	42	58	7·5	3·5	11	352
47	24	305	329	3	1	..	1	..	..	9	11	54	68	12	5·5	17·5	311·5
48	28	261	289	7	2	..	..	..	..	8	10	44	61	14	5	19	270
49	28	228	256	5	1	1	1	..	..	2	5	36	46	14	2·5	16·5	239·5
50	13	210	223	6	3	1	..	..	1	7	12	29	47	6·5	6	12·5	210·5
51	4	176	180	3	..	..	1	..	..	5	6	21	30	2	3	5	175
52	12	150	162	5	2	..	1	..	..	5	8	25	38	6	4	10	152
53	15	124	139	1	..	..	..	..	..	7	7	13	21	7 5	3·5	11	128
54	11	118	129	..	..	..	..	1	..	2	3	18	21	5·5	1·5	7	122
55	5	108	113	7	..	..	..	..	..	4	3	14	25	2·5	2	4·5	108·5
56	4	88	92	1	..	..	..	..	..	4	3	10	15	2	2	4	88
57	..	77	77	1	..	..	..	..	..	4	3	12	17	..	2	2	75
58	3	60	63	1	..	..	..	..	..	2	2	8	11	1·5	1	2·5	60·5
59	..	52	52	1	..	..	..	..	..	1	1	11	13	..	·5	·5	51·5
60	..	..	30	2	..	..	..	..	..	..	..	12	14	..	..	..	39
61	..	..	25	..	..	..	..	..	..	..	..	3	3	..	..	..	25
62	..	..	22	..	..	..	..	..	..	..	..	5	5	..	..	..	22
63	..	..	17	..	..	..	..	..	..	1	1	3	4	..	·5	·5	16·5
64	..	..	13	..	..	..	..	..	..	..	..	5	5	..	..	..	13
65	..	..	8	..	..	..	..	..	..	1	1	3	4	..	·5	·5	7·5
66	..	..	4	..	..	..	..	..	..	..	..	2	2	..	..	..	4
67	..	..	2	..	..	..	..	..	..	..	..	2	2	..	..	..	2
68	..	..	...	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	1,546		12·041	165	62	7	23	12	1	245	350	1,031	1,546	773·0	175·0	948·0	11093·0

the mortality from all causes was considered, and, therefore, in the determination of the number exposed to risk, the members retiring or withdrawing from the Society, only come under the head of "discontinued," but in Table II, the mortality from natural causes only is to be measured, and, therefore, the "discontinued" group will consist not only of the retired members, but also of those withdrawing or removing from the Society by all other causes, except natural death; consequently column *s* is found by deducting from column *d* the sum of columns *p* and *q*, or column *r*. The rest of Table II will be sufficiently understood by what has been said of Table I.

The following Abstract of this Table will make the results better understood.

ABSTRACT B.

Ages.	Number exposed to the risk of Mortality from natural causes.	Died.	Mortality per Cent.
19 to 20	2·5	...	...
21 ... 25	333·0	2	·600
26 ... 30	1,397·5	16	1·145
31 ... 35	2,182·5	29	1·324
36 ... 40	2,517·5	32	1·231
41 ... 45	2,187·0	34	1·555
46 ... 50	1,383·5	30	2·168
51 ... 55	685·5	16	2·480
56 ... 60	314·0	6	1·910
61 ... 65	84·0	...	...
66 ... 68	6·0	...	...
Total.....	11,093·0	165	1·488

The preceding, which shews the rate of mortality from natural causes, will be found to be much above that for the male population of the country generally at the same ages.

The next part of this subject to be considered, is the rate of mortality from accidental causes, or rather those causes peculiar to the occupation of master-mariners. Table III gives those results, and it will on consideration soon appear that in this instance the "discontinued" group must, for like reasons to those assigned in explanation of Table II, consist of the members who have died from natural causes, and those who have retired from the Society, that is, the numbers composing columns *e* and *p* of Table I. It will thus be found, that in Tables I, II, and III, the numbers exposed to the risk of mortality differ, and this arises from the fact that the peculiar contingency to be measured is different in each instance, and, hence, the difference of the quantities forming the last column of each Table. Table I measures the sum of the force of the two causes prevailing in each of the other two Tables, and, therefore, the greater number exposed to risk.

[The following

Table III.

Mortality from Accidental Causes.

Age.	Number Entered at each Age.	Number remaining under Observation from Age preceding.	Total Number under Observation at each Age.	Discontinued.			Deaths.						Alive.	Total gone off.	Half Entered and Half Discontinued.			Number Exposed to Risk.
				Died.	Retired.	Total.	Lost.	Violent Death.	Drowned.	Washed overboard.	Hung himself.	Total.			Entered.	Discontinued.	Total.	
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*k*	*l*	*m*	*n*	*o*	*p*	*q*	*r*	*s*	*t*
19	1	..	1	..	..	..	..	..	..	..	..	..	..	..	·5	..	·5	·5
20	2	1	3	..	..	..	..	..	..	..	..	..	..	..	1	..	1	2
21	15	3	18	..	..	..	..	..	..	..	..	..	1	1	7·5	..	7·5	10·5
22	28	17	45	..	..	..	..	..	..	..	..	..	..	..	14	..	14	31
23	32	45	77	..	1	1	1	..	..	..	..	1	1	3	16	·5	16·5	60·5
24	43	74	117	1	1	2	2	..	..	..	..	2	3	7	21·5	1	22·5	94·5
25	59	110	169	1	3	4	1	..	..	..	..	1	1	6	29·5	2	31·5	137·5
26	64	163	227	1	3	4	2	..	2	2	..	6	6	16	32	2	34	193
27	57	211	268	2	6	8	..	..	..	..	..	..	9	17	28·5	4	32·5	235·5
28	66	251	217	4	7	11	2	.	..	..	..	2	5	18	33	5·5	38·5	278·5
29	60	299	359	5	9	14	3	..	..	..	..	3	11	28	30	7	37	322
30	88	331	419	4	10	14	3	..	1	..	..	4	12	30	44	7	51	368
31	54	389	443	2	9	11	2	1	1	..	..	4	28	43	27	5·5	32·5	410·5
32	64	400	464	7	12	19	2	..	1	3	..	6	41	66	32	9·5	41·5	422·5
33	65	398	463	11	13	24	..	..	1	..	..	1	37	62	32·5	12	44·5	418·5
34	93	401	494	4	7	11	4	..	1	..	..	5	25	41	46·5	5·5	52	442
35	77	453	530	5	5	10	7	..	1	..	..	8	38	56	38·5	5	43·5	486·5
36	63	474	537	2	15	17	2	1	1	1	..	5	33	55	31·5	8·5	40	497
37	59	482	541	7	11	18	1	..	..	..	..	1	57	76	29·5	9	38·5	502·5
38	77	465	542	11	8	19	2	1	1	..	..	4	41	64	38·5	9·5	48	494
39	70	478	548	6	10	16	1	..	2	..	..	3	35	54	35	8	43	505
40	58	494	552	6	9	15	6	1	2	3	..	12	44	71	29	7·5	36·5	515·5
41	42	481	523	6	11	17	3	1	..	1	..	5	47	69	21	8·5	29·5	493·5
42	33	454	487	10	11	21	..	..	1	..	..	1	51	73	16·5	10·5	27	460
43	46	414	460	9	7	16	7	..	1	..	..	8	47	71	23	8	31	429
44	44	389	433	6	...	6	1	..	..	..	..	1	43	50	22	3	25	408
45	24	383	407	3	10	13	..	..	2	1	..	3	43	59	12	6·5	18·5	388·5
46	15	348	363	9	5	14	1	..	1	..	..	2	42	58	7·5	7	14·5	348·5
47	24	305	329	3	9	12	1	..	1	..	..	2	54	68	12	6	18	311
48	28	261	289	7	8	15	2	..	..	..	..	2	44	61	14	7·5	21·5	267·5
49	28	228	256	5	2	7	1	1	1	..	..	3	36	46	14	3·5	17·5	238·5
50	13	210	223	6	7	13	3	1	..	..	1	5	29	47	6·5	6·5	13	210
51	4	176	180	3	5	8	..	..	1	..	..	1	21	30	2	4	6	174
52	12	150	162	5	5	10	2	..	1	..	..	3	25	38	6	5	11	151
53	15	124	139	1	7	8	..	..	..	..	..	..	13	21	7·5	4	11·5	127·5
54	11	118	129	..	2	2	..	..	..	1	..	1	18	21	5·5	1	6·5	122·5
55	5	108	113	7	4	11	..	..	..	..	..	..	14	25	2·5	5·5	8	105
56	4	88	92	1	4	5	..	..	..	..	..	..	10	15	2	2·5	4·5	87·5
57	..	77	77	1	4	5	..	..	..	..	..	..	12	17	..	2·5	2·5	74·5
58	3	60	63	1	2	3	..	..	..	..	..	..	8	11	1·5	1·5	3	60
59	..	52	52	1	1	2	..	..	..	..	..	..	11	13	..	1	1	51
60	..	..	39	2	..	2	..	..	..	..	..	..	12	14	..	1	1	38
61	..	..	25	..	..	..	..	..	..	..	..	..	3	3	..	..	..	25
62	..	..	22	..	..	..	..	..	..	..	..	..	5	5	..	..	..	22
63	..	..	17	..	1	1	..	..	..	..	..	..	3	4	..	·5	·5	16·5
64	..	..	13	..	..	..	..	..	..	..	..	..	5	5	..	..	..	13
65	..	..	8	..	1	1	..	..	..	..	..	..	3	4	..	·5	·5	7·5
66	..	..	4	..	..	..	..	..	..	..	..	..	2	2	..	..	..	4
67	..	..	2	..	..	..	..	..	..	..	..	..	2	2	..	..	..	2
68	..	..	..	..	..	..	..	..	..	..	..	..	...	..	..	..	..	..
	1,546		12,041	165	245	410	62	7	23	12	1	105	1,031	1,546	773·0	205·0	978·0	11093·0

The following Abstract of this Table shews that in each of the three earlier quinquennial periods of life, the mortality from accidental causes is greater than in the more advanced periods of life, and should more extended inquiries confirm these results, it would be a curious circumstance to know that advanced years and increased experience enable master mariners to avoid many of the causes which occasion loss of life. There are many ways in which amongst more experienced captains this immunity from death may be accounted for, such as being in the command of a high class of vessels: but it is quite unnecessary to speculate on the cause.

ABSTRACT C.

Ages.	Number exposed to the risk of Death from accidental causes.	Died.	Mortality per Cent.
19 to 20	2·5	..	..
21 .. 25	334·0	4	1·197
26 .. 30	1,397·0	15	1·074
31 .. 35	2,180·0	24	1·101
36 .. 40	2,514·0	25	·995
41 .. 45	2,179·0	18	·826
46 .. 50	1,375·5	14	1·018
51 .. 55	680·0	5	·737
56 .. 60	311·0	..	..
61 .. 65	84·0	..	.
66 .. 68	6·0	..	..
Total....	11,063·0	105	0·949

Having thus determined the ratio of the loss of life from the various causes among master mariners, it may be interesting to shew the relation between the actual number of deaths, which has taken place from each of these causes, and that which would have happened, had the number of deaths been the same as among the male population of England and Wales, at the same ages.

ABSTRACT D.

Ages.	Number of Deaths from			
	All Causes.		Natural Causes.	
	Among Master Mariners.	Male Population of England and Wales.	Among Master Mariners.	Male Population of England and Wales.
19 to 20	0	·019	0	·019
21 ... 25	6	2·935	2	2·917
26 ... 30	31	14·022	16	13·947
31 ... 35	53	23·328	29	23·130
36 ... 40	57	29·272	32	29·133
41 ... 45	52	28·965	34	28·847
46 ... 50	44	21·692	30	21·583
51 ... 55	21	13·313	16	13·264
56 ... 60	6	7·943	6	7·943
61 ... 65	...	2·918	...	2·918
66 ... 68	...	·276	...	·276
Total.....	270	144·683	165	143·977

Hence, it appears, that while from all causes 270 deaths happened in the Master Mariners' Society, the number of deaths which would have happened according to the mortality of the male population of England and Wales, as taken from p. 5, *ante*, is 144·683, being an increased mortality of upwards of 86 per cent., but if the mortality between the ages 21 and 60 only be taken, the increase is 90 per cent.

Again, the same Abstract shews that while the mortality from natural causes was 165, the mortality according to the ratio for England and Wales was 143·977, being a difference of about 14·5 per cent., and if ages 21 to 60 only be included, the increase is about 18 per cent. This result certainly goes against the generally received opinion, that the deaths of mariners from natural causes only, is less than in the community generally, and shews the necessity of being very careful before drawing conclusions in the absence of clearly recorded and well analysed facts. There is no doubt that many inferences may be drawn from the data here presented, applicable to some of the questions at present agitated, in regard to the health of towns, and the sanitary condition of different districts, but as these speculations do not directly bear on the subject now under consideration, they had better not be at this place entered upon.

Table IV has been prepared in order to shew whether the age, and, therefore, as a general rule, the experience of captains of vessels, has any, and what influence on the losses of property under their charge. In this Table the "discontinued group" will consist of all causes of removal from the Society, whether by death or otherwise, as vessels could not be considered under the charge of members for an entire year, unless they were, without any interruption, members of the Society for the whole term of that year, and, therefore, if death or any other cause removed them from the Society in the course of the year, a correction must be applied, as in column *p*, on that account.

[Of the

Table IV.

Risk of Wrecks.

Age.	Number Entered at each Age.	Number under Observation from Age preceding	Total Number under Observation at each Age.	Wrecks.				Discontinued.				Half Entered and Half Discontinued.			Number Exposed to Risk.
				Wrecks.	Partial Wrecks.	Partial Loss by Fire.	Total.	Deaths.	Retired.	Alive.	Total.	Entered.	Discontinued.	Total.	
a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*k*	*l*	*m*	*n*	*o*	*p*	*q*
19	1	..	1	..	..	..	.	..	..	..	..	·5	..	·5	·5
20	2	1	3	..	..	..	..	..	..	..	..	1	..	1	2
21	15	3	18	..	..	..	..	.	..	1	1	7·5	·5	8	10
22	28	17	45	..	..	..	..	..	..	..	..	14	..	14	31
23	32	45	77	1	1	..	2	1	1	1	3	16	1·5	17·5	59·5
24	43	74	117	5	1	..	6	3	1	3	7	21·5	3·5	25	92
25	59	110	169	3	2	..	5	2	3	1	6	29·5	3	32·5	136·5
26	64	163	227	5	..	1	6	7	3	6	16	32	8	40	187
27	57	211	268	3	2	..	5	2	6	9	17	28·5	8·5	37	231
28	66	251	317	6	4	..	10	6	7	5	18	33	9	42	275
29	60	299	359	4	2	..	6	8	9	11	28	30	14	44	315
30	88	331	419	5	7	..	12	8	10	12	30	44	15	59	360
31	54	389	443	8	5	..	13	6	9	28	43	27	21·5	48·5	394·5
32	64	400	464	11	..	..	11	13	12	41	66	32	33	65	399
33	65	398	463	7	6	..	13	12	13	37	62	32·5	31	63·5	399·5
34	93	401	494	9	1	..	10	9	7	25	41	46·5	20·5	67	427
35	77	453	530	14	4	1	19	13	5	38	56	38·5	28	66·5	463·5
36	63	474	537	12	3	..	15	7	15	33	55	31·5	27·5	59	478
37	59	482	541	10	5	..	15	8	11	57	76	29·5	38	67·5	473·5
38	77	465	542	14	..	..	14	15	8	41	64	38·5	32	70·5	471·5
39	70	478	548	9	3	..	12	9	10	35	54	35	27	62	486
40	58	494	552	12	5	..	17	18	9	44	71	29	35·5	64·5	487·5
41	42	481	523	7	9	..	16	11	11	47	69	21	34·5	55·5	467·5
42	33	454	487	6	2	..	8	11	11	51	73	16·5	36·5	53	434
43	46	414	460	8	3	..	11	17	7	47	71	23	35·5	58·5	401·5
44	44	389	433	11	3	..	14	7	..	43	50	22	25	47	386
45	24	383	407	3	..	..	3	6	10	43	59	12	29·5	41·5	365·5
46	15	348	363	6	5	1	12	11	5	42	58	7·5	29	36·5	326·5
47	24	305	329	2	4	..	6	5	9	54	68	12	34	46	283
48	28	261	289	6	..	..	6	9	8	44	61	14	30·5	44·5	244·5
49	28	228	256	2	1	..	3	8	2	36	46	14	23	37	219
50	13	210	223	2	4	..	6	11	7	29	47	6·5	23·5	30	193
51	4	176	180	6	1	..	7	4	5	21	30	2	15	17	163
52	12	150	160	6	2	..	8	8	5	25	38	6	19	25	137
53	15	124	139	3	1	1	5	1	7	13	21	7·5	10·5	18	121
54	11	118	129	3	..	..	3	1	2	18	21	5·5	10·5	16	113
55	5	108	113	..	2	1	3	7	4	14	25	2·5	12·5	15	98
56	4	88	92	1	..	..	1	1	4	10	15	2	7·5	9·5	82·5
57	..	77	77	1	..	..	1	1	4	12	17	..	8·5	8·5	68·5
58	3	60	63	..	1	..	1	1	2	8	11	1·5	5·5	7	56
59	..	52	52	..	..	..	..	1	1	11	13	..	6·5	6·5	45·5
60	..	..	39	1	1	..	2	2	..	12	14	..	7	7	32
61	..	..	25	..	..	..	..	..	..	3	3	..	1·5	1·5	23·5
62	..	..	22	1	..	..	1	..	..	5	5	..	2·5	2·5	19·5
63	..	..	17	..	..	..	..	..	1	3	4	..	2	2	15
64	..	..	13	..	..	..	..	..	..	5	5	..	2·5	2·5	10·5
65	..	..	8	..	..	..	..	..	1	3	4	..	2	2	6
66	..	..	4	..	..	..	..	..	..	2	2	..	1	1	3
67	..	..	2	..	..	..	..	..	..	2	2	..	1	1	1
68	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	1,546		12,041	213	90	5	308	270	245	1,031	1,546	773·0	773·0	1,546·0	10,495·0

Of the 308 wrecks which have taken place, it will be observed that no less than 213 have been total wrecks, 90 partial wrecks, and 5 losses by fire.

The following Abstract exhibits in a condensed form the results arrived at in this Table.

ABSTRACT E.

Ages.	Number exposed to Risk of Wreck.	Total Number of Wrecks.		Per Centage, Yearly, of,		Total Losses.	
		Total Wrecks.	Partial Wrecks.	Total Wrecks.	Partial Wrecks.	Number.	Per Centage.
19 to 20	2·5	..	...	...	...	...	...
21 ... 25	329·0	9	4	2·736	1·216	13	3·951
26 ... 30	1,368·0	23	15	1·681	1·096	39	2·851
31 ... 35	2,083·5	49	16	2·352	0·768	66	3·168
36 ... 40	2,396·5	57	16	2·378	0·667	73	3·046
41 ... 45	2,054·5	35	17	1·703	0·827	52	2·531
46 ... 50	1,266·0	18	14	1·422	1·106	33	2·607
51 ... 55	632·3	18	6	2·848	0·949	26	4·114
56 ... 60	284·5	3	2	1·054	0·703	5	1·757
61 ... 65	74·5	1	...	1·342	...	1	1·342
66 ... 68	4·0	...	...	...	...	...	...
Total...	10,495·0	213	90	2·029	0·857	308	2·935

It will thus be seen, that at the younger ages, the wrecks and losses of property under the charge of master mariners, is greater than at the more advanced ages, and these facts, viewed in connection with the circumstance already alluded to, that the loss of life from accidental and extraordinary events is also more frequent at younger ages, strengthens the presumption, that increased years and experience among the captains of merchant vessels, give greater security to both life and property under their charge.

Having thus shewn the principal results arrived at, attention will be next directed to the application of them to the monetary affairs of Life Offices. It is very much to be regretted, that the proprietors and managers of Life Assurance Companies should have given so very little attention to the nature of the risks which they are constantly undertaking, and have contributed little or nothing in a pecuniary point of view, to the investigation of those branches of science, by the application of which the shareholders have realized immense and most exorbitant profits, on the capital invested in such speculations. It is notorious, that notwithstanding many societies have at command a greater capital than some of the Governments of Europe, there is not a single public document extant, throwing light on the state and condition of any other class of the community than their own members, published at the expense of those societies. Of the very meagre quantity of information which does exist, all has been derived from other sources; and there is no wonder, therefore, that in these wealthy corporations there should exist the anomalous feature unknown to other matters of enterprise and industry, of the practice being much in advance of the science on which it should be founded; in fact, after the most diligent inquiries, a single instance has not been found of any one of these great and powerful Companies, which boast of their millions of invested capital,

having spent £500 in the original investigation of any single branch or department of vital statistics. It is, therefore, hoped that it will not be considered out of place to bring under attention the details of a question which, under other circumstances, would properly belong to the traders in the shares of Life Assurance Institutions.

In the preceding inquiry, an analysis has been made of the various causes of death. This is, no doubt, important as suggesting means by which, under sanitary regulations, the intensity of some of those forces may be lessened, but, for the general purposes of a Life Office, a knowledge of the gross rate of mortality is all that is required. Attention is therefore now directed to the results given in Abstract A; from which a Table of Decrements may be easily formed. In that Abstract, the rate of mortality is given for quinquennial ages only, but the intermediate terms may be found in the following manner.

Let the figures in the second column of the following Abstract represent the original quantities for quinquennial ages, derived from Abstract A, and let the columns headed Δ_1, Δ_2, Δ_3, be the 1st, 2nd, and 3rd differences of the original quantities, also let (a), (b), and (c), which are the second and every alternate quantity in each of the three last columns, be equal to $\cdot 2\Delta_1$, $\cdot 04\Delta_2$, and $\cdot 008\Delta_3$, respectively.

ABSTRACT F.

Differences for Interpolation of Mortality from all Causes.

Age.	Mortality per Cent.	Δ_1 $a = \cdot 2\,\Delta_1$	Δ_2 $b = \cdot 04\,\Delta_2$	Δ_3 $c = \cdot 008\,\Delta_3$
23	1·791	+ ·415	— ·206	— ·165
		+ ·0830 = a	— ·00824 = b	— ·001320 = c
28	2·206	+ ·209	— ·371	— ·648
		+ ·0418	— ·01484	— ·005184
33	2·415	— ·162	+ ·277	+ ·404
		— ·0324	+ ·01108	+ ·003232
38	2·253	+ ·115	+ ·681	— 1·589
		+ ·0230	+ ·02724	— ·012712
43	2·368	+ ·796	— ·908	+ 2·195
		+ ·1592	— ·03632	+ ·017560
48	3·164	— ·112	+ 1·287	— 1·096
		— ·0224	+ ·05148	— ·008768
53	3·052	+ 1·175	+ ·191	+ ·521
		+ ·2350	+ ·00764	+ ·004168
58	4·227	+ 1·366	+ ·712	
		+ ·2732	+ ·02848	
63	5·593	+ 2·078		
		+ ·4156		
68	7·671			

Then the intervals to be interpolated being $\frac{1}{5}$, the intermediate terms to be inserted between the original quantities will be found as follows:—

$$\delta_1 = a - 2b + 6c$$

$$\delta_2 = b - 4c$$

and $\delta_3 = c$

It will

Abstract G.

Interpolation of Mortality from all Causes.

Age.	Mortality per Cent.	δ_1	δ_2	Age.	Mortality per Cent.	δ_1	δ_2
21	1·604280			46	3·077480	+·141640	
		+·093520				·070200	−·071440
22	1·697800		−·000320	47	3·147680		·053880
		·093200				+·016320	
23	**1·791**		·001640	48	**3·164**		−·194288
		·091560				−·177968	
24	1·822560		·002960	49	2·986032		+·086552
		·088600				·091416	
25	1·971160		·004280	50	2·894616		·077784
		·084320				−·013632	
26	2·055480		·005600	51	2·880984		·069016
		·078720				+·055384	
27	2·134200		−·006920	52	2·936368		·060248
		·071800				·115632	
28	**2·206**		+·030784	53	**3·052**		+·129096
		·102584				·244728	
29	2·308584		−·035576	54	3·296728		−·009932
		·067008				·235696	
30	2·375592		·030392	55	3·532424		·004864
		·036616				·230832	
31	2·412208		·025208	56	3·763256		−·000696
		+·011408				·230136	
32	2·423616		·020024	57	3·993392		+·003472
		−·008616				·233608	
33	**2·415**		·026552	58	**4·227**		+·059384
		·035168				·292992	
34	2·379832		−·001848	59	4·519992		−·001128
		·037016				·291864	
35	2·342816		+·001384	60	4·811856		·009896
		·035632				·281968	
36	2·307184		·004616	61	5·093824		·018664
		·031016				·263304	
37	2·276168		+·007848	62	5·357128		−·027432
		·023168				·235872	
38	**2·253**		−·084584	63	**5·593**		+·139440
		·107752				·375312	
39	2·145248		+·078088	64	5·968312		·024312
		−·029664				·399624	
40	2·115584		·065376	65	6·367936		·020144
		+·035712				·419768	
41	2·151296		·052664	66	6·787704		·015976
		·088376				·435744	
42	2·239672		·039952	67	7·223448		+·011808
		·128328				+·447552	
43	**2·368**		+·208872	68	**7·671**		
		·337200					
44	2·705200		−·106560				
		+·230640					
45	2·935840		−·089000				

It will be observed that there is considerable irregularity in the original quantities, as taken from Abstract A; but it was thought better not to disturb the natural results by any attempt to convert them into a graduated series. After the quinquennial period of life 50–55, the numbers are too small to warrant much reliance being placed on the results, and, therefore, subsequent to that period, an increasing series has been adopted, maintaining, as nearly as possible, the same relation at those advanced ages, to the ordinary tables of mortality for male life, as the figures in Abstract A, for younger ages, bear to the general mortality of England and Wales.

From the results thus obtained, the following Table of Decrements is derived.

TABLE V.

Decrements and Rate of Mortality from all causes.

Age.	Mortality per Cent. $= d.$	λl $5 + \Sigma(c) = \lambda l.$ $\lambda\left(1 - \frac{d}{100}\right) = c$	Number Living. $= l$	Number Dying.	Age.	Mortality per Cent. $= d.$	λl $5 + \Sigma(c) = \lambda l.$ $\lambda\left(1 - \frac{d}{100}\right) = c$	Number Living. $= l$	Number Dying.
21	1·604	5·0000000	100,000	1,604	40	2·116	4·8198832	66,052	1,398
		9·9929774					9·9907117		
22	1·698	4·9929774	98,396	1,671	41	2·151	·8105949	64,654	1,391
		·9925624					·9905564		
23	1·791	·9855398	96,725	1,732	42	2·240	·8011513	63,263	1,417
		·9921513					·9901612		
24	1·883	·9776911	94,993	1,789	43	2·368	·7913125	61,846	1,464
		·9917443					·9895922		
25	1·971	·9694354	93,204	1,837	44	2·705	·7809047	60,382	1,634
		·9913546					·9880905		
26	2·055	·9607900	91,367	1,877	45	2·936	·7689952	58,748	1,725
		·9909823					·9870582		
27	2·134	·9517723	89,490	1,909	46	3·077	·7560534	57,023	1,754
		·9906318					·9864268		
28	2·206	·9424041	87,581	1,933	47	3·148	·7424802	55,269	1,740
		·9903122					·9861086		
29	2·309	·9327163	85,648	2,009	48	3·164	·7285888	53,529	1,694
		·9896946					·9860368		
30	2·376	·9224109	83,639	1,987	49	2·986	·7146256	51,835	1,547
		·9895566					·9868344		
31	2·412	·9119675	81,652	1,969	50	2·894	·7014600	50,288	1,456
		·9893964					·9872461		
32	2·424	·9013639	79,683	1,932	51	2·881	·6887061	48,832	1,407
		·9893430					·9873042		
33	2·415	·8907069	77,751	1,878	52	2·936	·6760103	47,425	1,392
		·9893831					·9870582		
34	2·380	·8800900	75,873	1,805	53	3·052	·6630685	46,033	1,405
		·9895388					·9865389		
35	2·343	·8696288	74,068	1,736	54	3·297	·6496074	44,628	1,471
		·9897034					·9854399		
36	2·307	·8593322	72,332	1,668	55	3·532	·6350473	43,157	1,525
		·9898634					·9843833		
37	2·276	·8491956	70,664	1,609	56	3·763	·6194306	41,632	1,566
		·9900012					·9833421		
38	2·253	·8391968	69,055	1,556	57	3·993	·6027727	40,066	1,600
		·9901034					·9823029		
39	2·145	4·8293002	67,499	1,447	58	4·227	4·5850756	38,466	1,626
		9·9905830					9·9812431		

TABLE V.—*(continued.)*

Age.	Mortality per Cent. $= d.$	λl $5 + \Sigma(c) = \lambda l.$ $\lambda\left(1 - \frac{d}{100}\right) = c$	Number Living. $= l.$	Number Dying.	Age.	Mortality per Cent. $= d.$	λl $5 + \Sigma(c) = \lambda l.$ $\lambda\left(1 - \frac{d}{100}\right) = c$	Number Living. $= l.$	Number Dying.
59	4·520	4·5863187	36,840	1,665	80	18·384	3·6738961	4,720	868
		9·9799124					9·9117753		
60	4·812	·5462311	35,175	1,693	81	19·701	·5856714	3,852	759
		·9785822					·9047101		
61	5·094	·5248133	33,482	1,705	82	21·083	·4903815	3,093	652
		·9772937					·8971706		
62	5·357	·5021070	31,777	1,703	83	22·762	·3875521	2,441	556
		·9760885					·8878310		
63	5·593	·4781955	30,074	1,682	84	24·080	·2753831	1,885	454
		·9750042					·8803562		
64	5·968	·4531997	28,392	1,694	85	25·672	·1557393	1,431	367
		·9732757					·8711524		
65	6·368	·4264754	26,698	1,700	86	27·262	3·0268917	1,064	290
		·9714243					·8617614		
66	6·788	·3978997	24,998	1,697	87	28·862	2·8886531	774	224
		·9694718					·8521017		
67	7·223	·3673715	23,301	1,683	88	30·567	·7407548	550	168
		·9674403					·8415659		
68	7·671	·3348118	21,618	1,658	89	32·112	·5823207	382	122
		·9653381					·8317930		
69	8·228	·3001499	19,960	1,643	90	33·802	·4141137	260	88
		·9627102					·8208449		
70	8·813	·2628601	18,317	1,618	91	35·282	·2349586	172	61
		·9598329					·8110251		
71	9·487	·2226930	16,699	1,584	92	36·557	2·0459837	111	40
		·9567110					·8023837		
72	10·203	·1794040	15,115	1,542	93	37·629	1·8483674	71	27
		·9532618					·7949827		
73	11·026	·1326658	13,573	1,497	94	38·467	·6433501	44	17
		·9492631					·7891081		
74	11·909	·0819289	12,076	1,438	95	39·051	·4324582	27	11
		·9449315					·7849666		
75	12·881	4·0268604	10,638	1,370	96	39·635	1·2174248	16	6
		·9401129					·7807852		
76	13·874	3·9669733	9,268	1,286	97	40·219	0·9982100	10	4
		·9351343					·7765632		
77	14·957	·9021076	7,982	1,194	98	40·803	·7747732	6	2
		·9296386					·7722991		
78	16·040	·8317462	6,788	1,089	99	41·387	·5470729	4	2
		·9240724					9·7679940		
79	17·191	3·7558186	5,699	979	100	41·971	0·3150669	2	
		9·9180775							

From this has been constructed the following preparatory Table for the determination of the values of annuities, assurances, and other risks on the lives of Master Mariners.

Column D of Table VI has been formed for the expression $l_m v^m$, in which

l_m represents the numbers living at the age m in the fourth column of Table V,

And v^m represents the present value of £1 due m years hence, at 3 per cent. Also, if

D_m = quantity in column D, at any given age m, and

D_{m+x} = do. do. at any variable higher age $m + x$

then, in the same Table, will $N_m = \Sigma(D_{m+x})$, in which $m + x$ receives every integral value from any given age, to the oldest age in the Table.

[From Table

Table VI.

Preparatory to the determination of the Values of Annuities, &c. &c., on the Lives of Master Mariners.
(Three per Cent.)

Age.	λD	D	N	Age.	λD	D	N
21	4·7304183	53754·92	928568·52	61	3·7417426	5517·50	45291·41
22	·7105585	51352·14	877216·38	62	·7061991	5083·92	40207·49
23	·6902836	49009·88	828206·50	63	·6694503	4671·43	35536·06
24	·6695977	46730·20	781476·30	64	·6316173	4281·71	31254·35
25	·6485048	44514·84	736961·46	65	·5920558	3908·91	27345·44
26	·6270222	42366·46	694595·00	66	·5506429	3553·39	23792·05
27	·6051672	40287·21	654307·79	67	·5072774	3215·71	20576·34
28	·5829618	38279·11	616028·68	68	·4618805	2896·55	17679·79
29	·5604368	36344·34	579684·34	69	·4143814	2596·46	15083·33
30	·5372942	34458·32	545226·00	70	·3642544	2313·42	12769·91
31	·5140135	32659·80	512566·22	71	·3112500	2047·62	10722·29
32	·4905727	30943·73	481622·49	72	·2551238	1799·38	8922·91
33	·4670785	29314·23	452308·26	73	·1955484	1568·73	7354·18
34	·4436244	27773·10	424535·16	74	·1319743	1355·11	5999·07
35	·4203259	26322·42	398212·74	75	3·0640685	1158·96	4840·114
36	·3971921	24956·98	373255·76	76	2·9913442	980·267	3859·847
37	·3742183	23671·09	349584·67	77	·9136413	819·674	3040·173
38	·3513823	22458·58	327126·09	78	·8304427	676·772	2363·401
39	·3286484	21313·19	305812·90	79	·7416778	551·668	1811·733
40	·3063942	20248·56	285564·34	80	·6469181	443·525	1368·208
41	·2842687	19242·82	266321·52	81	·5458562	351·444	1016·764
42	·2619879	18280·49	248041·03	82	·4377291	273·986	742·778
43	·2393118	17350·49	230690·54	83	·3220624	209·924	532·854
44	·2160668	16446·24	214244·30	84	·1970562	157·419	375·435
45	·1913201	15535·31	198708·99	85	2·0645752	116·031	259·4037
46	·1655411	14640·00	184068·99	86	1·9228904	83·7318	175·6719
47	·1391306	13776·24	170292·75	87	·7718146	59·1309	116·5410
48	·1124020	12953·94	157338·81	88	·6110790	40·8394	75·7016
49	·0856016	12178·72	145160·09	89	·4398077	27·5301	48·1715
50	·0595988	11470·93	133689·16	90	·2587635	18·1453	30·0262
51	·0340076	10814·53	122874·63	91	1·0667712	11·6620	18·3642
52	4·0084746	10197·05	112677·58	92	0·8649590	7·32755	11·03665
53	3·9826956	9609·38	103067·20	93	·6545055	4·51342	6·52323
54	·9563973	9044·76	94022·44	94	·4366510	2·73307	3·79016
55	·9289999	8491·80	85530·64	95	0·2129219	1·63276	2·15740
56	·9005460	7953·27	77577·37	96	9·9850512	·96616	1·19124
57	·8710509	7431·06	70146·31	97	·7529992	·56624	·62500
58	·8405166	6926·54	63219·77	98	·5167252	·32864	·29636
59	·8089224	6440·54	56779·23	99	·2761877	·18888	·10748
60	3·7759976	5970·32	50808·91	100	9·0313444	·10748	·00000

From Table V preceding, and Table C, pp. 5-6 *ante*, the following results have been obtained; shewing for different ages the equation of life for Master Mariners, and also for the male population of England and Wales.

Ages.	Equation of Life.		
	Mariners.	England and Wales.	Difference per Cent.
21	29·1	44·0	51·2
30	25·0	36·5	46·0
40	20·9	28·8	37·8
50	15·5	21·2	36·8
60	10·5	14·3	36·2

The foregoing is sufficient to shew the necessity of great caution in undertaking special risks on life, and the need of careful and extensive statistical research, to form a basis for calculations in this branch of life contingencies. Within the last few years, Assurance Institutions have very much increased, and the public journals sufficiently testify to the remarkable efforts made by them to extend their business among all ranks and grades of society. It is, therefore, of the first importance that those entrusted with the management of such companies, should possess accurate statistical information, to guide them in their transactions with the public. The practice of a mere arbitrary imposition of premiums for special risks unfortunately prevails to too great an extent, and is liable to very serious objections. The hazard of charging inadequate terms, may endanger the safety of the institutions, and exorbitant rates limit the practice of life assurance, while the want of clear and satisfactory data, produces distrust among the managers themselves, and deprives their efforts of that confidence and energy, which is necessary to the successful development of every enterprise. It is, therefore, hoped that the preceding facts may not be void of practical value and importance, while to the mere scientific inquirer, their novelty will recommend them to some share of attention.

It has been thought better to submit a complete analysis of one class of facts, than to bring under review a variety of data in a cursory manner: but it may be satisfactory to view, in connection with the preceding data derived from the Master Mariners' Society exclusively, another body of facts originating in other sources, namely, in the other Mariners' Friendly Societies distributed over the kingdom, and constituting a portion of the data described in pp. 17–19 *ante*, and which embraces, generally, an humbler class of sea-faring men, than the Master Mariners.

ABSTRACT H.

Ages.	Number exposed to Risk.	Deaths	Mortality per Cent.	Mortality per Cent. in the Master Mariners' Society. (Abstract A.)
20 to 25	1,562	39	2·4968	1·791
26 ... 30	5,060	108	2·1343	2·206
31 ... 35	6,842	167	2·4408	2·415
36 ... 40	7,549	184	2·4374	2·253
41 ... 45	5,783	152	2·6283	2·368
46 ... 50	3,227	104	3·2228	3·164
51 ... 55	1,716	62	3·6130	3·052
56 ... 60	651	12	1·8433	1·911
61 ... 65	119	2	1·6882	...
Total.....	32,509	830	2·5531	2·423

The rate of mortality, it will be seen, differs but slightly in the two classes of results, and calls for no particular commentary. Connected with this last body of facts, there has also been made a return of the amount of sickness or invaliding: but the discussion of that part of the inquiry must be reserved for a subsequent part of these contributions, in which the question of sickness generally will be considered.

MORTALITY OF THE PROVIDENT CLASSES IN THIS COUNTRY AND ON THE CONTINENT.

In the present Contribution it is intended to exhibit the rate of Mortality which prevails among the Wealthy, the Middle, and the Provident Classes of this Country and of the Continent.

It has been shewn in pp. 93-9 *ante*, that until the beginning of this year England and Wales were the only portions of the United Kingdom in which public mortuary registers were kept, and, consequently, in which the rate of mortality of the whole population could be accurately measured. In the other divisions of the kingdom, the rate of mortality is known only inferentially, and not by direct observation, and nowhere do the published portion of the public records, as fully explained in pp. 10–16 *ante*, afford the means by which to determine the duration of life in particular classes of the community. There are, however, other sources from which much information may be derived.

In the year 1843, a report was made, by a committee of actuaries, on the mortality among the persons assured by seventeen of the principal assurance companies of this country, (see Table H, col. 5, pp. 40 1,) and these persons may be fairly considered to belong to the middle and upper classes of society; and at various periods since the year 1824, inquiries have been made into the rate of mortality among the members of friendly societies, including the more industrious and prudential of the working and the labouring portion of the people. One important result derived from these investigations is, that while the mortuary registers shew a certain rate of mortality for the whole population of England and Wales, the evidence furnished by the facts constituting the other body of information clearly proves the mortality of the middle and upper classes to be above, and that of the industrious working classes to be below, the ratio for the country generally. This conclusion forms an important consideration in all sanitary inquiries: and, by an obvious inference, determines in what class or section of the people the excessive rate of mortality prevails. For other reasons, however, it is a subject of the first importance to understand clearly the rate of mortality among the middle and upper classes.

The *Journal of the Statistical Society* contains a valuable body of evidence on this question, which goes to prove that among the peerage, the country gentry, and the professional classes, the rate of mortality is higher than that of the country generally: and, as already pointed out in pp. 42–3, the report by the committee of actuaries shews, that among the lives assured by the public companies of this country, the mortality is also not less than that of the general population.

In support of the results derived from this latter body of facts, there is abundant collateral proof; but it has been thought desirable to test them, if possible, by facts originating in quite an independent source. With this view, an analysis has been made of the experience of some of the life assurance offices in Germany, one of which, the Gotha Society, the largest in the world, had, in the 21 years ending January 1850, assured 22,063 lives. There were, in the beginning of the year 1850, subsisting assurances on no less than 15,471 of these lives; and, on the 1st of January of the present year the number of lives assured was 18,858.

From the following Tables, it will be seen that a very elaborate investigation has been made of the facts presented, and that some of the combinations formed are of a novel character in vital statistics; but a very few observations will suffice to bring the results under criticism, as the various Tables and Abstracts sufficiently explain themselves. It should be stated that the information is collected from the very admirable annual reports of the Gotha Life Office, and that wherever tabulated results were furnished in these documents, their accuracy has been tested by a reconstruction of the figures from the original abstracts.

The following Table exhibits the rate of mortality in this Society for each of the eight years 1842–49, and the difference for each quinquennial term of life between the actual rate of mortality and that expected according to the data on which the rates or scale of premiums in use by the Society are based, named, a rate of mortality assimilating closely to the "Equitable Experience."

TABLE I.

Age.	1842.			1843.			1844.			1845.		
	Persons.	Deaths.	Expected.	Persons.	Deaths.	Expected.	Persons.	Deaths.	Expected.	Persons	Deaths.	Expected.
15 to 25	114	..	0·72	116	..	0·72	119	1	0·79	116	..	0·76
26 .. 30	491	4	4·01	498	4	4·06	513	3	4·29	553	3	4·58
31 .. 35	1,277	7	12·49	1,280	11	12·48	1,335	6	13·09	1,323	9	13·02
36 .. 40	2,180	26	24·41	2,190	19	24·54	2,180	15	24·46	2,185	14	24·72
41 .. 45	2,335	27	28·15	2,505	26	30·04	2,620	18	31·66	2,779	22	33·75
46 .. 50	1,920	28	29·02	2,073	32	31·03	2,246	36	33·66	2,362	40	35·85
51 .. 55	1,513	24	29·82	1,644	33	32·11	1,753	30	34·48	1,865	31	36·86
56 .. 60	1,068	31	26·82	1,162	32	29·25	1,251	24	31·87	1,309	44	33·28
61 .. 65	612	26	20·00	652	18	21·58	713	34	22·96	806	28	26·36
66 .. 70	301	19	13·13	342	21	15·05	376	21	16·73	406	33	18·05
71 .. 85	77	6	5·36	104	7	7·69	143	12	10·82	181	14	13·90
Total..	11,888	198	193·93	12,572	203	208·55	13,249	200	224·81	13,885	238	241·13
	1846.			1847.			1848.			1849.		
15 to 25	116	..	0·72	129	1	0·76	106	..	0·62	93	..	0·60
26 .. 30	569	4	4·71	613	6	4·97	557	3	4·57	559	2	4·67
31 .. 35	1,334	11	13·08	1,381	9	13·53	1,376	17	13·46	1,358	16	13·25
36 .. 40	2,233	27	25·09	2,248	26	25·13	2,182	31	24·69	2,207	22	24·87
41 .. 45	2,851	24	34·53	2,922	29	35·52	2,887	40	35·20	2,822	32	34·34
46 .. 50	2,534	27	38 30	2,726	49	40·94	2,852	38	43·66	2,944	31	44·82
51 .. 55	2,007	29	39·55	2,131	43	42·26	2,217	45	44·20	2,357	34	46·75
56 .. 60	1,373	29	34·99	1,522	44	38·44	1,605	45	40·84	1,713	64	43·42
61 .. 65	883	29	28·83	964	38	31·82	1,053	55	34·79	1,100	56	36·22
66 .. 70	459	30	20·47	473	24	21·36	523	32	23·79	553	46	24·95
71 .. 85	205	19	16·76	252	24	20·80	294	33	24·45	341	34	28·39
Total..	14,564	229	257·03	15,361	293	275·53	15,652	339	290·27	16,047	337	302·28

An inspection of the preceding Table will shew, that in four out of the eight years, there has been experienced a greater number of deaths, than expected according to the Tables of the Society, namely, in the years 1842, 1847, 1848, and 1849; and, according to the following Abstract, it will be seen that the excess of deaths for the whole of the eight years has been 43·47, being about 2·180 per cent. on the expected mortality.

ABSTRACT A.

Mortality during the Years 1842—1849.

Ages.	Number of Persons Assured.	Actual Deaths.	Sum of Actual Deaths.	Expected Deaths.	Sum of Expected Deaths.
15 to 25	909	2	...	5·7	...
26 ... 30	4,353	29	31	35·9	41·6
31 ... 35	10,664	86	117	104·4	146·0
36 ... 40	17,605	180	297	157·9	343·9
41 ... 45	21,721	218	515	263·2	607·1
46 ... 50	19,657	281	796	297·3	904·4
51 ... 55	15,487	269	1,065	306·0	1210·4
56 ... 60	11,003	313	1,378	278·9	1489·3
61 ... 65	6,789	284	1,662	222·6	1711·9
66 ... 70	3,433	226	1,888	153·5	1865·4
71 ... 85	1,597	149	2,037	128·2	1993·6
	113,218	2,037		1993·6	

It is worthy of remark, at this point of the inquiry, that, under the age of 55, the actual rate of mortality is uniformly less then the expected rate, averaging about 12 per cent. less than the rate calculated upon; but, on the other hand, the actual mortality above the age of 55 exceeds the expected mortality about 24 per cent. A comparison of the columns headed "persons assured," for each of the nine years represented in Table I, with the figures in the fourth column of Table XV, following, will shew that the number of persons given in Table I, for each year, is the gross number assured, and not the number exposed to the risk of a whole year's mortality; it would, therefore, lead to a false estimate of the mortality, were it to be measured with reference to the numbers in the columns headed "persons assured;" but this has evidently not been done in the determination of the numbers in the columns headed "expected deaths;" they are derived from the correct number exposed to a whole year's risk of mortality.

It will be observed that the excess of 43 deaths over the expected number in Table I and Abstract A preceding, is due chiefly to the years 1848–9; in the former year, the difference being about 49, and in the latter 35 deaths, the united difference being nearly double that of the gross difference for the eight years under review. It is, therefore, obvious that this result depends on some temporary cause, namely, epidemics prevalent in those years, as will be hereafter seen.

If reference be now made to Table II, which gives the history of the 1285 lives assured in the first year of the Society's existence, it will be found that, at the end of the

year 1838, there had been 196 deaths; the policies on the lives of 124 had lapsed; and 965 persons still remained assured; irrespective of all those assuring subsequent to the year 1829. It will be further seen that the actual number of deaths is almost identical with the number expected, according to the data on which the Society's calculations are based: corresponding very closely with the rate of mortality observed among assured lives generally in this country. It will be further seen that, except at the quinquennial term of life, 56-60, at which the numbers assured are very small, and therefore subject to fluctuation, there is no very important difference between the actual and expected rate of mortality.

TABLE II.

Ages.	Number of Persons Assured in 1829.	Deaths during 1829—1838.				Number of Lives upon which Policies have Lapsed.	Number of Policies subsisting at the end of 1838.
		Expected.	Sum of Expected.	Actual.	Sum of Actual.		
16 to 25	19	1·3	...	1	...	4	14
26 .. 30	85	7·1	8·4	5	6	19	61
31 ... 35	189	18·7	27·1	15	21	27	147
36 ... 40	276	32·5	59·6	27	48	18	231
41 ... 45	254	34·8	94·4	40	88	20	194
46 ... 50	184	31·9	126·3	32	120	19	133
51 ... 55	160	35·5	161·8	33	153	12	115
56 ... 60	97	26·5	188·3	36	189	5	56
61 ... 65	21	7·7	196·0	7	196	...	14
	1,285	196·0		196		124	965

The following Table (III) exhibits the rate of mortality among the members of the Society for the twenty-one years 1829–49; and it will be seen, that while the expected mortality was 3193·83, the actual deaths have been 3144, falling short of the expected mortality by about 50 deaths, or 1·560 cent. lower than the expected mortality. It will also be observed that in this, as in Abstract A, the actual exceeds the expected mortality by 19·3 per cent. above the age of 55, but is less under that age by 12·7 per cent. A comparison of the facts presented in this Table, with those in Table II and Abstract A, shews, in a remarkable degree, the amount of deterioration which takes place in the health of the assured after the expiration of a few years from the date of admission. In Table III, the actual number of deaths falls short of the number expected by the Tables of the Society about 1·560 per cent., but in Abstract A, the actual mortality exceeds the expected by 2·180 per cent. The former body of facts embraces all the members of the Society, not only those originally admitted, but also those recently enrolled; and while it includes the mortality of the older class of members long subsequent to their admission, it also contains the mortality in the early years of admission in the same class, and, at the same time, the mortality of those persons but recently admitted. On the other hand, the latter body of facts (Abstract A), although it contains the mortality of members recently admitted, or those entering the Society subsequent to the year 1841, yet it does not contain the mortality for

the older class of members for any of the years preceding 1842; and although, as already remarked, this excess of mortality may be partly due to the epidemics of 1848–9, still it is obvious that the increased mortality is also to some extent owing to the exclusion of the experience of the first fourteen years of the older class of members. That this must be the case, is further evident, from a consideration of the results in Table II, which must be regarded as intermediate between the two other groups of facts just alluded to, as it is free from the admixture of the recently-admitted members with the older, all having been admitted in the year 1829; and it will be observed, that the actual number of deaths is almost identical with that expected by the Tables of the Society; while also, in respect to Table II, it will be observed that there is much greater uniformity in the actual and expected deaths at the different terms of life than in either Abstract A or Table III, and this result is consistent with the exclusion of the new admissions, chiefly taking place at the younger terms of life, in the two other classes of facts.

TABLE III.

Mortality during the Years 1829—1849.

Ages.	Number of Persons Assured.	Actual Deaths.	Sum of Actual Deaths.	Expected Deaths.	Sum of Expected Deaths.
15 to 25	1,931	8	...	12·0	...
26 ... 30	9,199	71	79	73·8	85·8
31 ... 35	22,490	189	268	214·6	300·4
36 ... 40	33,928	304	572	373·1	673·5
41 ... 45	37,228	356	928	442·0	1115·5
46 ... 50	32,362	440	1,368	481·5	1597·0
51 ... 55	25,016	450	1,818	485·9	2082·9
56 ... 60	17,618	481	2,299	440·3	2523·2
61 ... 65	10,370	412	2,711	334·8	2858·0
66 ... 70	4,477	271	2,982	198·6	3056·6
71 ... 85	1,734	162	3,144	137·3	3193·9
	196,353	3,144		3193·9	

In order to determine the relation between the actual rate of mortality prevailing among the members of the Gotha Life Society and that of other classes of lives, it is necessary, in the first place, to ascertain the number of persons exposed to the risk of a whole year's mortality at the different terms of life, and this may be easily done by the following formula, in which

a = the total number of persons entering the Society during the whole 21 years, as given in column 3, Table XV.

b = the total number of persons on whose lives policies have lapsed from other causes than death, during the same period of years, as given in column 5, Table XV.

c = the gross number of persons assured at one time or another during the same 21 years, as set forth in column 2, Table III, for the same terms of life at which members

enter or retire from the Society; and, therefore,

$\frac{a+b}{c} \cdot \frac{100}{2}$ = the quantity to be deducted from column 2, Table III, for the same period of life, in order to determine the gross number exposed to the risk of a whole year's mortality. But this quantity cannot be applied as an average ratio to each term of life, as the admissions and demissions are not uniform over each term or period of life in the Table. Let, therefore, the figures in columns 2 and 7 of Table II represent the correct ratio of persons entering the Society, and also withdrawing from all causes, death excepted; also let

d = the total of the numbers in columns 2 and 7 for any term of life in Table II;

e = the sum of the numbers in the two columns 2 and 7 for any given term of life; and

n = the number of the terms of life at which members enter and withdraw; then

$\lambda x = \lambda e + \lambda\left(\frac{a+b}{c} \cdot \frac{100}{2} \cdot n\right) - \lambda d$. And if

f = the quantity at any particular term of life in Table III; then will

$f.(100 - x)$ = the number forming the second column of the following Table.

TABLE IV.

Age.	Number exposed to the risk of Mortality for a whole Year.	Number of Deaths that would have happened according to the Mortality of England and Wales. Males.	Sum of the Deaths.	Actual Deaths in the Society.	Sum of Actual Deaths.
15 to 25	1,912	15·6	...	8	...
26 ... 30	8,788	87·7	103·3	71	79
31 ... 35	20,403	216·9	320·2	189	268
36 ... 40	29,642	343·0	663·2	304	572
41 ... 45	32,846	433·2	1096·4	366	928
46 ... 50	29,540	460·8	1557·2	440	1,368
51 ... 55	23,420	453·2	2010·4	450	1,818
56 ... 60	16,846	426·0	2436·4	481	2,299
61 ... 65	10,276	357·0	2793·4	412	2,711
66 ... 70	4,477	221·5	3014·9	271	2,982
71 ... 84	1,734	181·8	3196·7	162	3,144
	179,884	3196·7		3,144	

Column 3 of the preceding Table shews, that if the rate of mortality in the Society had been the same as among the male population of England and Wales, (Table C, pp. 5–6 *ante*) the total number of deaths would have been 3196·59, while, according to column 5 of Table III, the expected mortality by the Tables of the Society was 3194, and, as in column 5 of the present Table, the actual mortality had been 3144. It is therefore evident that the average rate of mortality for the whole population of this country does not, for the whole term of life under observation in Table IV, differ in any important degree from the rate assumed for the basis of the Society's calculations; and it is further evident from a comparison of the last column of Table III, with columns 4 and 6 of Table IV, that the rate of mortality among the general population of England and Wales

approximates nearer to the actual rate of mortality experienced by the Society for the respective terms of life, than the rate assumed in the construction of the Society's Tables; shewing that Table C, just alluded to, is better graduated for practical purposes, than that in actual use by the Society.

In Table V will be found the rate of mortality according to various series of observations. The results in column 2 are deduced from columns 2 and 5 of Table IV, and, therefore, represent the rate of mortality experienced in the Gotha Life Office. And it will be seen, that throughout the whole of life, the mortality is almost always less than among the peerage or the males of the government annuitants, and not differing widely from the results for the whole male population of England and Wales, and those for the lives of the assurance societies in England, but the mortality is much above that experienced by the members generally of friendly societies in England and Wales. A consideration of the peculiar features and constitution of those humble provident institutions, will fully explain the reasons of this increased longevity among the industrious and provident portion of the working classes of this country. This part of the question has already been treated at length in pp. 17–101 *ante*. Column 4 in the following Table represents the rate of mortality as observed among the male members generally of friendly societies throughout England and Wales; but if reference be made to Appendix A of the

TABLE V.

Age	Rate of Mortality per Cent. according to the					
	Gotha Life Office.	England and Wales. Males. Whole Population.	Friendly Societies. Rural, Town, and City Districts. England and Wales. Males.	Peerage.	Government Annuitants. Males.	Assurance Societies in England.
15 to 15	·418	·815	·679	·507	1·37	·738
26 ... 30	·808	·998	·732	·788	1·38	·814
31 ... 35	·926	1·063	·798	·949	1·18	·892
36 ... 40	1·026	1·157	·887	1.130	1·40	·991
41 ... 45	1·084	1·319	1·038	1·533	1·40	1·125
46 ... 50	1·490	1·560	1·281	2·118	1·49	1·426
51 ... 55	1·921	1·935	1·696	2·581	2·32	1.909
56 ... 60	2·855	2·529	2·244	3·212	2·92	2·639
61 ... 65	4·009	3·474	3·030	4·322	4·08	3·784
66 ... 70	6·053	4·947	4·614	5·764	6·17	5·563
71 ... 84	9·343	10·482	8·584	8·155	11·43	11·147

Report of the Select Committee of the House of Lords appointed to consider certain matters connected with Provident Associations, session 1847-8, paper No. 126, some interesting examples will be found of remarkable differences in the rates of mortality and sickness in those societies. In a very able paper by Mr. Farr, in the second edition of "M'Culloch's Statistics of the British Empire," it is stated that there is reason to believe that further inquiries will shew that not only sickness, but mortality, will increase in

friendly societies generally; and the results of a recent investigation among the members of Odd Fellow Societies appear to support this opinion, so far as respects mortality. The facts brought forward in the "Contributions on the Rate of Mortality in the Medical Profession," pp. 112–133 *ante*, will also be found to be strikingly corroborative of the general principle which seems to regulate the mortality of other classes, namely, that the humble but industrious working classes, whose prudential habits lead them to become members of these societies, are subject to a less rate of mortality than any other, and that the higher the class of society over which the observations extend, until the peerage, or highest class of all, is observed, in which there is less of the regular and healthful daily exercise essential to the condition of the industrious workman, the greater the rate of mortality; and for intermediate classes, a varying degree of mortality is observable, following pretty closely the scale of their position in social rank.

From the facts brought forward, it appears that the duration of life in the German States of Europe, among the higher provident classes, who embrace the principles of life assurance, is fully equal to that among the like classes in this country, and the value of life amongst those classes approximates closely to the rate of mortality for the general population of England and Wales; but the humbler provident classes who enrol themselves members of friendly societies in this country, enjoy a prolonged duration of life above all others.

That an idea may be formed of how far the results in Tables I, II, III, IV, and the second column of Table V, may be indicative of the state of health of the populations of the different German States, it may be important to shew the number of persons assured for the middle of the period of the 21 years 1829-49, namely, at the end of the year 1838 in each of those districts.

District.	Persons.	In every 100,000 Inhabitants.	District.	Persons.	In every 100,000 Inhabitants.
Ducal and Grand Ducal Saxon Territories	753	118	Brought forward...	7,466	
Free Cities	188	62	Oldenburg	74	29
Brunswick	123	49	Hesse Darmstadt	200	28
Principalities, Lippe and Waldeck	73	46	Mecklenburg, Schwerin and Strelitz	151	27
Prussia	4,267	41	Hohenzollern-Hechingen and Sigmaringen	10	16
Hesse Cassel	289	41	Bavaria	584	14
Hanover	625	37	Baden	168	14
Principalities, Schwarzburg, Anhalt, and Reuss	129	36	Nassau	41	11
Würtemburg	515	32	Danish German Territories	33	8
Kingdom of Saxony	504	31	German Switzerland	52	4
Carried forward...	7,466			8,779	

The greatest number of the assurers, nearly 49 per cent. of the whole, are in Prussia;

but the States having the greatest proportion of its population assured, are the Ducal and Grand Ducal Saxon territories; and those having the least proportion assured, are the Danish and Swiss German territories.

With the view to determine whether any and what law prevailed in relation to the period which has elapsed from the date of assuring to the date of death among those persons dying in the years 1839-49, distinguishing the age at the time of being assured, a detailed Abstract has been made of each policy, classifying together those of the same age at the date of assuring, and at the same time setting forth the period elapsing until the day of death, and thence arriving at the average period which elapsed from the date of taking out their policies till the day of death, for those entering the Society at different ages. The following Table shews the results arrived at:—

Table VII.

Period elapsed from the date of Assuring, till Death, of those Dying among the Assured, during the Years 1839-49.

Age at which the Assurances were effected.	No. of Deaths.	Duration of Life.		Duration of Life to each Person.		Age at which the Assurances were effected.	No. of Deaths.	Duration of Life.		Duration of Life to each Person.	
		Years.	Months.	Years.	Months.			Years.	Months.	Years.	Months.
15	2	12	11	6	6	42	74	725	9	9	10
16	...	...	...	...	...	43	83	843	9	10	2
17	1	5	5	5	5	44	74	679	8	9	2
18	...	...	...	...	...	45	68	639	2	9	1
19	1	7	8	7	8	46	69	681	4	9	10
20	3	14	8	4	11	47	81	785	9	9	8
21	1	7	2	7	2	48	83	766	8	9	3
22	4	43	7	10	11	49	87	845	3	9	9
23	5	40	0	8	0	50	89	864	2	9	8
24	14	95	6	6	10	51	73	720	2	9	10
25	20	161	0	8	1	52	72	635	6	8	10
26	16	95	2	6	0	53	87	852	11	9	10
27	29	266	11	9	3	54	72	804	0	11	2
28	48	316	3	6	7	55	64	656	9	10	3
29	51	386	3	7	7	56	76	708	4	9	4
30	49	420	0	8	7	57	49	422	2	8	7
31	52	411	5	7	11	58	81	825	3	10	2
32	70	616	11	8	10	59	72	574	11	8	0
33	78	567	0	7	3	60	28	307	1	11	0
34	62	531	8	8	7	61	14	177	0	12	8
35	93	727	1	7	10	62	11	99	9	9	1
36	66	533	8	8	1	63	8	67	0	8	5
37	78	742	1	9	6	64	7	59	4	8	6
38	75	655	5	8	9	65	3	29	4	9	9
39	72	552	11	7	8	66	2	13	3	6	7
40	81	863	6	10	8	67	2	17	5	8	8
41	71	702	11	9	11						

No very distinct or obvious difference is here observable in the various classes of results; and attention is therefore directed to the following Abstract:—

Abstract C.

Period elapsed from the date of Assuring, till Death, of those Dying among the Assured, during the Years 1839-49.

Age.	Number of Deaths.	Duration of Life.		Duration of Life to each Person.		Duration of Life.		Duration of Life to each Person.	
		Years.	Months.	Years.	Months.	Years.	Months.	Years.	Months.
15 to 19	4	26	0	6	6	26	0	6	6
20 .. 24	27	200	11	7	5	1,246	6	6	6
25 .. 29	164	1,225	7	7	6				
30 .. 34	311	2,547	0	8	2	5,758	2	8	4
35 .. 39	384	3,211	2	8	4				
40 .. 44	383	3,815	7	10	0	7,533	9	9	9
45 .. 49	388	3,718	2	9	7				
50 .. 54	393	3,876	9	9	11	7,064	2	9	8
55 .. 59	342	3,187	5	9	4				
60 .. 64	68	710	2	10	5	770	2	10	3
65 .. 67	7	60	0	8	7				
Total ..	2,471	22,778	9	9	3				

In which it will be seen, contrary to what would generally be expected, that the period which elapsed from the date of the policies to the date of death is less at the younger than the older ages; so that, if such a law were found generally to prevail, it would follow that a Life Office should find the deaths taking place among the younger lives more immediate than among the older class of lives. Whether this unexpected and apparently anomalous result may arise from the fact that, at the earlier ages, the deaths take place from acute and rapidly-fatal diseases, while at the advanced periods of life, they happen from chronic and lingering causes, is not clearly borne out by the analysis as far as it has yet proceeded; but that such is very probably the case, will appear from a consideration of the preceding

Age.	Per Centage of Members Sick during each Year.	Ratio of Sick Members to every 100 not Sick in every Year.	Mortality per Cent. among those Actually Sick.	Sickness per Annum among those Actually Sick.	Total amount of Sickness to each Death.
11 to 15	21·9565	28·1337	·9901	4·1231	416·4290
16 .. 20	22·0743	28·3273	2·8571	3·5887	125·6032
21 .. 25	22·0386	28·2686	3·0539	3·8518	126·1271
26 .. 30	21·6997	27·7134	3·3271	4·1921	125·9977
31 .. 35	21·0147	26·6058	3·7592	4·3585	115·9411
36 .. 40	21·5471	27·4650	4·0686	4·9463	121·5732
41 .. 45	22·9858	29·8463	4·5306	5·9418	131·1468
46 .. 50	24·6042	32·6333	5·1657	6·8556	132·7123
51 .. 55	27·6422	38·2022	6·2401	8·5104	136·3839
56 .. 60	30·2424	43·3535	7·2732	10·9261	150·2235
61 .. 65	35·5676	55·2015	8·6163	15·1975	176·3808
66 .. 70	46·8493	88·1443	9·6004	24·2217	252·2988
71 .. 75	58·3750	140·2400	12·1306	32·6275	268·9679
76 .. 80	73·5916	278·6667	11·3636	36·2367	318·8876
81 .. 85	74·4624	291·5790	18·4116	37·7633	205·1064
86 .. 90	79·4872	387·5000	17·2043	41·0829	238·7943
91 .. 95	50·0000	100·0000	..	39·2450	..

figures, derived some time ago from the experience of friendly societies in Scotland, from which very accurate and interesting returns were received and carefully analysed.

It is therefore evident that, from the younger to the more advanced ages, there is, among all classes, a uniformly increasing rate of sickness to each death. At the term of life 31-5, there are 116 weeks' sickness to each death, and the rate goes on increasing to the period 76-80, in which the amount of sickness is 319 weeks to each death.

However, the preceding simply shews the average amount of sickness among all the members of a society to each death taking place among the same members at different ages; and the results are not fairly applicable as illustrative of the principle or law manifested in Abstract C, in which it would appear that the period which has elapsed between the date of effecting policies and the date of death of the persons assured thereunder, is less at the younger than at the older ages. For, to determine whether this law has any connection with the more acute forms of disease peculiar to younger ages, only the resulting sickness ending in death, or among those finally dying, at the given terms of life under consideration, should be measured; but it may be interesting, and also important, to shew the average duration of sickness not ending in death, as well as of that proving fatal.

In the following Abstract will be found the results of 5640 attacks of sickness, resulting in recovery; from which it appears that the average duration of each attack is 8·636 weeks: but it is necessary to observe how very much the duration of sickness depends on the age of the persons affected; under the age of 35, the average duration of each attack is about 4·372 weeks; from that to the age of 50, each attack lasts about 5·131 weeks; in the subsequent period of ten years, the duration of each attack is 11·717 weeks; and beyond that age (60), it will be seen that sickness becomes very protracted.

ABSTRACT D.

Duration, in weeks, of Sickness ending in Recovery.

Age.	Attacks.	Sickness.	Average Duration of each Attack.
11 to 15	12	39·428	3·286
16 .. 20	106	592·143	5·586
21 .. 25	587	2399·714	4·088
26 .. 30	900	4363·000	4·848
31 .. 35	955	3798·857	3·978
36 .. 40	772	3870·571	5·014
41 .. 45	678	3598·286	5·307
46 .. 50	433	2192·857	5·064
51 .. 55	415	4794·428	11·553
56 .. 60	364	4333·000	11·904
61 .. 65	246	5286·286	21·489
66 .. 70	88	4219·143	47·945
71 .. 75	68	5713·571	84·023
76 .. 80	14	2862·286	204·449
81 .. 85	2	642·857	321·428
	5,640	48706·427	8·636

It should be clearly kept in view, that the Abstract just given represents such sickness only as ended in the recovery of the members; but in the following Abstract are given the results of 1012 attacks of sickness among 437 persons, whose deaths took place at the terms of life represented in the Table. The figures given in columns 8, 9, and 10, of this Abstract, differ in a remarkable manner from the results at corresponding ages in Abstract D.

Abstract E.

Duration, in weeks, of Sickness ending in Death.

Age.	*a.* Total Amount of Sickness.	*b.* Amount of Sickness immediately before Death.	*a*−*b.* Amount *not* ending in Death of those afterwards Dying.	*c.* Attacks.	*d.* Persons.	*c*−*d.* Attacks *not* ending in Death of those afterwards Dying.	Average duration of each Attack in Total Sickness of those afterwards Dying	Average duration of Attack immediately before Death.	$\frac{a-b}{c-d}$ Average duration of Attacks *not* ending in Death of those afterwards Dying.
16 to 20	157·428	132·714	24·714	11	7	4	14·312	18·959	6·178
21 .. 25	430·571	282·857	714·714	50	26	24	8·611	10·879	6·230
26 .. 30	1120·000	657·714	462·286	85	38	47	13·176	17·308	9·836
31 .. 35	1215·286	700·714	514·572	119	48	71	10·212	14·598	7·247
36 .. 40	654·143	338·857	315·286	100	40	60	6·541	8·471	5·255
41 .. 45	560·428	229·428	331·000	80	38	42	7·005	6·037	7·880
46 .. 50	1252·857	800·428	452·429	86	36	50	14·568	22·234	9·048
51 .. 55	1839·857	1178·714	661·143	122	47	75	15·081	25·079	8·815
56 .. 60	2838·571	2167·000	671·571	127	49	78	22·351	44·224	8·609
61 .. 65	3816·000	3435·714	380·286	104	41	63	36·692	83·798	6·036
66 .. 70	1715·571	1379·286	336·285	47	23	24	36·502	59·969	14·011
71 .. 75	3154·428	3097·143	57·285	48	23	25	65·717	134·658	2·291
76 .. 80	1726·571	1673·571	53·000	15	7	8	115·105	239·081	6·625
81 .. 85	3384·143	3313·714	70·429	17	13	4	199·067	254·901	17·607
86 .. 90	..	..	..	..	..	..	..	..	..
91 .. 95	353·000	353·000	..	1	1	..	353·000	353·000	..
	24218·854	19740·854	4478·000	1012	437	575	23·932	45·173	7·788

It will be seen that column 8 represents the average duration of each attack of sickness, including that ending in death, as well as preceding attacks of sickness. In Abstract D, under the age of 35, it was 4·372 weeks; but in column 8, the average duration is 10·830 weeks; and in the more advanced periods of life, a similar increase in the duration of sickness is observable; so that it would seem to follow that the duration of sickness is greater among those dying at periods not very remote from the attacks, than among those surviving; and, consequently, if the duration simply of sickness be closely observed, it offers an element of considerable importance in measuring the expectation or future lifetime of individuals. In Abstract D, the average duration of each attack of sickness for all ages is 8·636 weeks; but in Abstract E, the average duration is 23·932 weeks. The former class of facts relates to persons who all survived the period of twelve years over which the observations extended; but the latter class belongs to persons all of whom died within the same period of twelve years. The force of this conclusion will be more strongly felt, if attention be directed to the figures in column 9, which represent the average duration of the attack of sickness ending in death, at which it will be seen that at every term of life the fatal attack of sickness is of much greater duration than

those represented in column 8, or in Abstract D. The following condensed Abstract will assist in giving a general view of those results.

Age.	Average Duration of each Attack of Sickness.			
	Ending in Final Recovery. Abstract D.	Not ending in Death, but among those afterwards Dying. Col. 10, Abstract E.	Immediately preceding Death. Col. 9, Abstract E.	Among those Dying, including the Attacks immediately preceding Death, and others. Col. 8, Abstract E.
11 to 35	4·372	7·872	14·907	11·031
36 ... 50	5·131	7·228	12·006	9·276
51 ... 60	11·717	8·711	34·851	18·789
60 and upwards	44·794	7·236	122·708	60·990
Total.....	8·636	7·788	45·173	23·932

It is hence obvious, that having regard to the ages of persons, the duration of any attack of sickness is a most important consideration in calculating the chances of recovery. If another element, the frequency of a series of attacks of sickness, were introduced (but the details it would here be out of place to discuss), the value or the duration of life of invalids may be calculated with even more precision than the expectation of life of the general community; and if the analysis were carried one step further, and the same classification adopted as in the preceding Abstracts, only keeping the sickness peculiar to each disease by itself, a series of results would be arrived at, furnishing elements of the greatest value in the estimation of the value of life among persons who have suffered or are suffering from disease. Notwithstanding the immense pecuniary interests at stake by life offices, no inquiry or investigation of this kind has ever been undertaken by them, and the preceding and other similar collections of facts, are, it is believed, the only sources of information so analysed which anywhere exist. From the specimens now furnished from the records of friendly societies, the very remarkable aids which they must afford in estimating the value of peculiar classes of lives, by confining fluctuations within known limits, must be evident. The trouble and expense of collecting such data is very great, but still the information itself is of tenfold value to the life institutions of the country.

In the following Abstract will be found the combined results of Abstracts D and E, preceding; and in this, as in all the others, will be found evidence of the same general principle or law of nature which has led to this investigation of the duration of sickness peculiar to different terms of life, namely, that the duration of sickness either in the attacks immediately preceding death, or otherwise, is less protracted at the younger and middle periods of life, than at the more advanced; and hence the solution of the otherwise anomalous facts arrived at in Abstract C, that of the deaths which have taken place among the lives assured at the earlier ages, the time elapsed from the date of the policies to that of death is less than among those assured at the more advanced ages.

Abstract F.

Average Duration, in weeks, of Total Sickness.

Age.	Total Number of Attacks, including those ending in Recovery and those ending in Death.	Total Amount of Sickness, including that ending in Recovery and that ending in Death.	Average Duration of each Attack of Sickness, including that ending in Recovery, and that ending in Death.	Number of Attacks, including those ending in Recovery, and those not ending in Death of those afterwards Dying.	Amount of Sickness, including that ending in Recovery, and that not ending in Death of those afterwards Dying.	Average Duration of each Attack of Sickness, including that ending in Recovery, and that not ending in Death of those afterwards Dying.
11 to 15	12	39·428	3·286	12	39·428	3·286
16 .. 20	117	749·571	6·407	110	616·857	5·608
21 .. 25	637	2830·285	4·443	611	2547·428	4·169
26 .. 30	985	5483·000	5·566	947	4825·286	5·095
31 .. 35	1,074	5014·143	4·668	1,026	4313·429	4·204
36 .. 40	872	4524·714	5·188	832	4185·857	5·031
41 .. 45	758	4158·714	5·486	720	3929·286	5·457
46 .. 50	519	3445·714	6·639	483	2645·286	5·477
51 .. 55	537	6634·285	12·354	490	5455·571	11·133
56 .. 60	491	7171·571	14·606	442	5004·571	11·322
61 .. 65	350	9102·286	26·004	309	5666·572	18·338
66 .. 70	135	5934·714	43·960	112	4555·428	40·673
71 .. 75	116	8867·999	76·448	93	5770·856	62·052
76 .. 80	29	4588·857	158·236	22	2915·286	132·513
81 .. 85	19	4027·000	211·947	6	713·286	118·881
86 .. 90	..	..	..	..	..	..
91 .. 95	1	353·000	353·000	..	..	..
	6,652	72925·281	10·959	6,215	53184·427	8·557

Attention is next directed to the following Table, which is somewhat analogous in its character to Abstract C, only that the element of age, with the view to its more simple application to practical purposes, is excluded. From the register of deaths for the years 1840-9, an abstract has been made of those which have taken place in the first, second, third, and every subsequent year from the date of the policies; and the results constitute the following Table:—

TABLE VIII.

Year.	Deaths among the Assured after the lapse of the following Number of Years from the Date of Assurance.																				
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	Total.
1840.....	11	14	14	9	17	9	13	15	17	8	5	13	..	..	..	..	..	..	..	..	..	143
1841.....	14	9	11	10	10	11	14	14	23	15	7	8	18	..	..	..	..	..	..	..	..	164
1842.....	6	8	13	17	14	17	15	20	14	14	24	10	5	21	..	..	..	..	..	..	..	198
1843.....	9	13	5	19	16	10	14	7	14	16	15	20	13	8	24	..	..	..	..	..	..	203
1844.....	4	11	10	9	9	8	14	15	13	7	19	19	26	10	8	18	..	..	..	..	..	200
1840 to 1844..	..	44	53	53	64	66	55	70	71	81	60	70	70	62	39	32	18	..	..	..	..	908
1845.....	11	13	9	8	5	17	12	21	10	11	8	20	25	16	16	12	24	..	..	..	..	238
1846.....	7	13	3	8	20	10	11	15	21	9	14	9	14	18	16	9	8	24	..	..	..	229
1847.....	14	14	15	16	8	12	12	18	12	15	19	18	18	20	25	19	6	7	25	..	..	293
1848.....	7	14	12	14	17	17	16	15	18	14	23	21	21	11	16	23	27	17	7	29	..	339
1849.....	4	13	14	14	8	19	14	13	15	17	13	17	16	22	15	24	17	22	8	14	38	337
Total..	87	120	106	124	124	130	135	153	157	126	147	155	156	126	120	105	82	70	40	43	38	2,344
Order of Mortality	6	9	8	10	10	12	13	15	18	11	14	16	17	11	9	7	5	4	2	3	1	

On referring to Abstract C, it will be found that the average period which had elapsed from the date of the policies to the day of death, was nine years and three months; and in the preceding Table it will be also seen, that the greatest number of deaths took place in the ninth year after the date of the policies, the oldest policy being then about twenty-one years. During the five years 1840–4, it is curious to observe, that the greatest number of deaths was also among policies of nine years' standing, although the oldest policy was then of sixteen years' duration only; and it is still further to be observed, that during the five years 1840–4, about one-half of all the deaths took place in the first eight years of the policies; but for the ten years 1840–9, one-half of all the deaths happened in the first nine years, the oldest policies being, in the latter case, of five years' greater duration. At the same time it will be seen that the number of deaths per annum has gone on increasing from 143, in 1840, to 337 in 1849—in the former year, the number of persons assured being 10,234, and in the latter, 15,036; so that, although the number of persons assured increased about 48 per cent., the deaths increased to the extent of 136 per cent. The numerals at the top of the Table shew the duration of the policies, and those in the bottom line of the Table shew the order in which the deaths took place, from the minimum, in the twenty-first year, to the maximum, in the ninth year. It is obvious that the solution of the results here presented will be derived from the law of mortality exhibited in Table IV, the number of persons assured in each year, and the ages of those persons; and that any fluctuation whatever taking place in any one of these elements, must disturb the results set forth in Table VIII. This is observable in Abstract C, the age of the persons assured shewing an important influence on the duration of the policies.

There are also other important practical considerations, as well as those of a more

strictly philosophical and scientific nature, connected with the period of the year at which the deaths took place, and it may therefore be interesting to shew how far the seasons affect the number of deaths in the aggregate, as well as at the different ages or terms of life. In the following Table will be found an analysis of all the deaths which took place in the eleven years 1839–49, distinguishing the months of the year in which they happened, and also the ages at death:—

TABLE IX.

Ages at which the Deaths among the Assured took place in different Months, during the Years 1839—49.

Age.	MONTHS.												Total.
	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
16	...	...	...	1	...	...	...	...	...	...	...	...	1
22 to 24	...	...	1	...	1	...	1	...	...	...	...	...	3
25 ... 29	2	3	2	2	1	...	5	2	6	4	5	5	37
30 ... 34	8	12	15	10	11	5	6	10	8	9	9	10	113
35 ... 39	16	18	19	10	15	19	20	19	20	23	14	24	217
40 ... 44	22	20	31	26	33	16	22	15	21	24	20	28	278
45 ... 49	26	21	34	28	33	26	27	19	27	19	29	24	313
50 ... 54	25	21	33	33	22	26	23	31	31	26	30	33	334
55 ... 59	31	32	30	36	30	29	22	29	29	21	41	33	363
60 ... 64	25	23	41	28	34	19	35	23	31	34	36	26	355
65 ... 69	21	28	29	28	21	26	18	14	22	19	26	19	271
70 ... 74	11	12	12	7	16	10	13	9	9	14	10	16	139
75 ... 79	5	3	3	5	4	2	2	2	3	3	6	4	42
80 ... 84	1	2	1	...	...	...	...	...	...	...	...	1	5
Total...	193	195	251	214	221	178	191	173	207	196	226	223	2,471

It thus appears that the greatest number of deaths took place in the month of March, and the least in the month of August; the three months of least mortality being August, June, and January; the three months next in order being July, February, and October; then September, April, and May; and the three months of highest mortality are December, November, and March. If, however, the year were divided into quarters of consecutive months, it will be found that they stand in the following order:—

Quarter in which the Mortality is of			
Lowest Intensity.	Second Intensity.	Third Intensity.	Highest Intensity.
June	December	September	March
July	January	October	April
August	February	November	May

The months of March, April, and May, it will be seen, constitute the quarter of highest mortality; and out of the following five classes of facts, it will be found that, in three instances, they constitute the quarter of highest mortality, and the month of March enters into the highest quarter of four out of the five groups of facts.

Table X.

Sweden.—Years 1831-5.			Gotha Life Office.—Years 1829-49.	
Months.	Males.	Both Sexes.	Months.	Males.
July	11,608	22,416	August	173
October	11,988	23,391	June	178
November	12,848	25,579	January	193
June	13,474	25,955	July	194
December	14,390	28,134	February	195
August	14,467	28,391	October	196
February	14,480	28,731	September	207
September	14,569	28,404	April	214
January	15,867	31,231	May	221
May	16,220	32,130	December	223
March	16,317	32,299	November	226
April	16,476	32,666	March	251

Saxony.—Years 1832-8.		Belgium, Towns.—Years 1815-26.		Glasgow.—Years 1836-42.	
Months.	Males.	Months.	Both Sexes.	Months.	Both Sexes.
October	1,893	July	0·87	June	4,258
July	1,920	June	0·90	October	4,339
November	1,921	August	0·91	September	4,409
September	1,927	May	0·95	July	4,457
June	1,932	September	0·97	May	4,542
December	1,986	April	1·00	November	4,597
August	2,007	October	1·00	April	4,720
January	2,220	November	1·02	August	4,873
February	2,231	March	1·05	December	5,267
May	2,331	December	1·08	February	5,517
March	2,387	February	1·09	March	5,523
April	2,424	January	1·16	January	7,090

But in respect to the quarter of least mortality, the results are more variable. July enters into four of the five groups, June into two, and August into only one. These remarks have reference to the aggregate mortality only, but if reference be now made to Table IX, it will be seen that the seasons have a very material influence on the mortality of different ages. The following Abstract exhibits the results for different terms of life.

Abstract G.

Ages.	Months.												Total.
	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
Under 40	26	33	37	23	28	24	32	31	34	36	28	39	371
40—59	104	94	128	123	118	97	94	94	108	90	120	118	1,288
60 & upwards	63	68	86	68	75	57	68	48	65	70	78	66	812
Total.....	193	195	251	214	221	178	194	173	207	196	226	223	2,471

It thus appears that under the age of 40, the least mortality has been in the month of April, and the greatest in the month of December; but in the term of life 40–59, the least mortality has been in the month of October, and the highest in the month of March. Again, in respect to the most advanced term of life, those aged 60 and upwards, the least mortality has, as in the case for the aggregate of all ages, been in the month of August, and the highest likewise in the month of March. The following, then, will represent the quarters of highest and lowest mortality:—

	Ages at which the Deaths happened.			
	Under Age 40.	Ages 40—59.	Aged 60 and upwards.	Results for all Ages.
Quarter of Least Mortality ...	April, May, June.	June, July, August.	June, July, August.	June, July, August.
Quarter Second in Intensity	July, August, September.	December, January, February.	December, January, February.	December, January, February.
Quarter Third in Intensity	January, February, March.	September, October, November.	September, October, November.	September, October, November.
Quarter of Highest Mortality	October, November, December.	March, April, May.	March, April, May.	March, April, May.

Hence, by dividing the year into quarters formed of consecutive months, representing the highest and lowest mortality, it will be seen that the combinations agree for all the terms of life except those for ages under 40: and this is in conformity with the results already observed under Abstracts C, D, E, and F; the more acute form of diseases peculiar to those ages being differently affected by changes of temperature and seasons; but if, instead of the combinations into quarters, the mortality be arranged in the order of the months, a much greater disparity in the results will be observable:—

	Order of the Months of Lowest and Highest Mortality, for those Dying aged			
	Under 40.	40—59.	60 and upwards.	All Ages.
1	April	October	August	August
2	June	February	June	June
3	January	July	January	January
4	May	August	September	July
5	November	June	December	February
6	August	January	February	October
7	July	September	April	September
8	February	May	July	April
9	September	December	October	May
10	October	November	May	December
11	March	April	November	November
12	December	March	March	March

The influence of the seasons on the mortality at different ages is hence obvious, and there can be little doubt that a more extended series of observations would lead to a well defined law in this respect. The importance of the question to life institutions and to

science, it is hoped, will induce those interested in such objects to investigate the matter further.

The next part of this inquiry to be brought under consideration is that which relates to the disease, or cause of death. The Report of the Gotha Society for the year 1838 contains an abstract of the causes of death for the ten years 1829–38, arranging the diseases according to a general and popular form of classification; and the Report for the year 1848 contains a similar abstract for the twenty years 1829–48. The following shews the results arrived at:—

ABSTRACT H.

Disease.	Number of Deaths during the Years												
	1829 to 1838.						1829 to 1848.						
	At Ages					Total.	At Ages.						Total.
	21 to 30.	31 to 40.	41 to 50.	51 to 60.	61 to 72.		17 to 30.	31 to 40.	41 to 50.	51 to 60.	61 to 70.	71 to 83.	
Fever	7	21	38	50	9	125	17	101	143	144	71	15	491
Influenza	..	9	10	3	7	29	..	11	12	9	12	5	49
Asiatic Cholera	..	2	5	5	..	12	..	4	12	8	5	..	29
Exanthemic Diseases	1	2	..	1	..	4	2	5	..	1	1	..	9
Local Inflammation	2	20	19	29	15	85	12	72	106	103	75	16	384
Gout and Rheumatism	3	3	7	9	3	25	4	13	25	22	23	2	89
Chronic Pulmonary Diseases	8	38	33	22	7	108	19	115	166	111	46	1	458
Chronic Abdominal Diseases	..	14	14	10	7	45	..	37	65	86	74	12	274
Mental Affections	..	3	1	1	2	7	..	9	11	18	9	2	49
Diseases of Spinal Marrow	..	3	3	2	2	10	..	5	9	7	10	2	33
Organic Diseases of the Heart	1	..	4	3	..	8	2	4	12	20	16	1	55
Dropsy	..	4	17	25	6	52	3	16	56	94	71	11	251
Cancers and Malignant Ulcers	..	1	13	8	5	27	..	2	22	20	14	6	64
Apoplexy	2	10	21	52	27	112	7	29	69	151	116	20	392
Old Age	..	..	..	..	4	4	..	..	..	1	35	42	78
Accidents	..	2	3	3	..	8	..	6	11	13	6	..	36
Murdered	..	..	..	..	..	..	..	1	1	..	..	..	2
Suicide	2	4	2	3	..	11	4	15	19	20	6	..	64
Total	26	136	190	226	94	672	70	445	739	828	590	135	2,807

It will thus be seen that, during the first ten years, 672 deaths happened; and during the whole period of twenty years, 2807 deaths.

ABSTRACT I.

Disease.	Ratio of Deaths from each of the Six Causes to the whole Mortality, during the Years					
	1829—1838.		1839—1848.		1829—1848.	
	Deaths.	Per Centage.	Deaths.	Per Centage.	Deaths.	Per Centage.
Fever	125	18·602	366	17·141	491	17·492
Chronic Pulmonary Diseases	108	16·071	350	16·392	458	16·317
Apoplexy	112	16·667	280	13·113	392	13·965
Local Inflammation	85	12·649	299	14·003	384	13·680
Chronic Abdominal Diseases	45	6·696	229	10·725	274	9·761
Dropsy	52	7·738	199	9·320	251	8·942
Total	527	78·423	1,723	80·694	2,250	80·157

The preceding Table represents the ratio of deaths which have taken place from six principal classes of disease during each decennial period, and during the whole twenty years, without distinction of ages.

From a subsequent Table, it will be found that the average age of the assured varied, in the twenty years to which the preceding figures relate, from 43 years to 47 years, and hence might be expected an increased number of deaths from apoplexy, which is generally believed to press with greater intensity as age increases; such, however, it will be seen, is not the case, so far as the preceding facts are concerned, for, in the first decennial period, the deaths from apoplexy formed about 17 per cent. of the whole, while in the second ten, the deaths from that cause were a little above 13 per cent. only. There can be no doubt that this difference is, to a great extent, if not entirely, due to the small number of deaths included in the first period; and it will be, therefore, more advantageous to examine the results in connection with the number of lives exposed to the risk of mortality at the various terms of life. The following exhibits, therefore, the ratio of deaths per cent. to the population exposed to the risk of mortality from different causes, according to the preceding classification of disease:—

TABLE XI.

Disease.	Ratio of Deaths from Different Causes during 1829 to 1848, at the following Ages.													
	17—30.		31—40.		41—50.		51—60.		61—70.		71—83.		All Ages.	
	Number of Lives at Risk during 1829—1848.													
	10,074		46,884		57,208		36,421		13,110		1,393		165,090	
	No. of Deaths.	Mortality per Cent.	No. of Deaths.	Mortality per Cent.	No. of Deaths.	Mortality per Cent.	No. of Deaths.	Mortality per Cent.	No. of Deaths.	Mortality per Cent.	No. of Deaths.	Mortality per Cent.	No. of Deaths.	Mortality per Cent.
Fever	17	·169	101	·215	143	·250	144	·395	71	·542	15	1·077	491	·297
Influenza	..	..	11	·023	12	·021	9	·025	12	·092	5	·359	49	·030
Asiatic Cholera	..	..	4	·009	12	·021	8	·022	5	·038	..	..	29	·018
Exanthemic Diseases	2	·020	5	·011	..	..	1	·003	1	·008	..	..	9	·005
Local Inflammation	12	·119	72	·154	106	·185	103	·283	75	·572	16	1·149	384	·233
Gout and Rheumatism	4	·040	13	·028	25	·044	22	·060	23	·175	2	·144	89	·054
Chronic Pulmonary Diseases.	19	·189	115	·245	166	·290	111	·305	46	·351	1	·072	458	·277
Chronic Abdominal Diseases.	..	..	37	·079	65	·114	86	·236	74	·564	12	·861	274	·132
Mental Affections	..	..	9	·019	11	·019	18	·049	9	·069	2	·144	49	·030
Diseases of Spinal Marrow	..	..	5	·011	9	·016	7	·019	10	·076	2	·144	33	·020
Organic Diseases of the Heart	2	·020	4	·009	12	·021	20	·055	16	·122	1	·072	55	·033
Dropsy	3	·030	16	·034	56	·098	94	·258	71	·542	11	·790	251	·152
Cancers and Malignant Ulcers	..	..	2	·004	22	·038	20	·055	14	·107	6	·431	64	·039
Apoplexy	7	·069	29	·062	69	·121	151	·415	116	·885	20	1·436	392	·237
Old Age	..	..	..	..	..	..	1	·003	35	·267	42	3·015	78	·047
Accidents	..	..	6	·013	11	·019	13	·036	6	·046	..	..	36	·022
Murdered	..	..	1	·002	1	·002	..	..	..	..	..	..	2	·001
Suicide	4	·040	15	·032	19	·033	20	·055	6	·046	..	..	64	·039
All Diseases	70	·695	445	·949	739	1·291	828	2·273	590	4·560	135	9·691	2,807	1·703

In the class of disease denominated fever, in the preceding Table, it will be seen that the mortality uniformly increases from the younger to the older ages. With respect to the group of diseases "local inflammation," it will be seen, that although there is an increase

in the rate of mortality from the younger to the older ages, still the difference is very slight under the age of 50, and the intensity greatest of all at the term of life 61–70. Again, with respect to "chronic pulmonary diseases," the bulk of the deaths took place between the ages of 31–70, and the rate of mortality increases from ·245 per cent. in the term of life 31–40, to ·351 per cent. at ages 61–70. In the class "chronic abdominal diseases," the mortality increases in a very rapid manner from the younger to the older ages, being only ·079 per cent. at ages 31–40, and as much as ·564 per cent. at ages 61–70. Similar results connect themselves with the deaths from dropsy: but in the section "apoplexy," the greatest variation is observable in connection with a difference of age; at the term of life 31–40, the mortality is ·062 per cent., increasing rapidly till ages 71–83, in which it is 1·436 per cent. from this disease. This is in accordance with the received opinion of medical men on the character of this disease.

If the influence of the above mentioned six groups of diseases be now viewed in connection with specific terms of life, it will be seen that, in the decennial period, 31–40, the greatest rate of mortality has taken place from "pulmonary diseases," next from "fevers," then from "local inflammations," "abdominal diseases," "apoplexy," and least of all from "dropsy;" and in the next ten years of life, the mortality of these diseases follows the same order as to their intensity. In the term of life 51–60, however, the following is the order in which the same six diseases stand as to intensity:—apoplexy, fever, pulmonary diseases, inflammation, dropsy, and abdominal diseases. And in the ten years 61–70, the order is again varied, being apoplexy, inflammation, abdominal diseases, fever and dropsy equal, and pulmonary diseases at the bottom of the scale; and in the most advanced term of life of the preceding Abstract, the following is the order of intensity of the diseases:—apoplexy, inflammation, fever, abdominal diseases, dropsy, and pulmonary diseases. The following arrangement may perhaps exhibit these results in a more simple form:—

Diseases arranged according to the order of their Intensity at the following Terms of Life.

31—40.	41–50.	51–60.	61—70.	71—83.
Pulmonary Diseases.	Pulmonary Diseases.	Apoplexy.	Apoplexy.	Apoplexy.
Fevers.	Fevers.	Fevers.	Inflammations.	Inflammations.
Inflammations.	Inflammations.	Pulmonary Diseases.	Abdominal Diseases.	Fevers.
Abdominal Diseases.	Abdominal Diseases.	Inflammations.	Fevers. }	Abdominal Diseases.
Apoplexy.	Apoplexy.	Dropsy.	Dropsy. }	Dropsy.
Dropsy.	Dropsy.	Abdominal Diseases.	Pulmonary Diseases.	Pulmonary Diseases.

Pulmonary disease is, therefore, so far as the preceding facts are concerned, essentially the disease of highest intensity in the destruction of life under 50, and above that age, apoplexy; the other diseases maintaining varying but intermediate positions in the scale of mortality.

The preceding classification of diseases, although it is that given in the Reports referred to, is evidently not sufficiently exact in its arrangement to merit much further criticism on the results; and it has therefore been thought desirable to classify the deaths according to a better nosological system. The whole of the deaths for the eleven years 1839–49, have, therefore, been so classified: the facts given not admitting of the deaths in the first ten years being so treated. It will be seen, that during the eleven years 1839–49, there have been 2471 deaths, and in the ten years 1829–38, there have been 672 deaths, making in all 3143, so that nearly 79 per cent. of the whole become subject to the more complete nosological classification. The information furnished respecting each death, not only gives the age and cause of death, but also the age at the time the life was assured; in every instance distinguishing the ages to the nearest month, so that a new and

TABLE

Deaths in the Gotha Life Office from All

CAUSES OF DEATH.	AGE.											
	Under 20.		20—24.		25—29.		30—34.		35—39.		40—44.	
	No.	Duration.	No.	Duration.	No.	Duration.	No.	Duration.	No.	Duration.	No.	Duration.
		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.
All Causes	1	1 5	3	6 9	37	117 10	113	391 2	217	1,129 4	278	1,851 1
Specified Causes	1	1 5	3	6 9	37	117 10	113	391 2	217	1,129 4	278	1,851 1
I. Zymotic Diseases	..	..	1	0 2	10	24 11	38	110 4	60	325 8	64	458 3
SPORADIC DISEASES.												
II. Dropsy, Cancer, and other Diseases of uncertain or variable seat	..	..	..	..	2	5 6	9	28 10	18	87 9	38	298 7
III. Tubercular Diseases	..	..	1	1 2	9	36 5	38	158 0	54	279 2	74	343 10
IV. Diseases of the Brain, Spinal Marrow, Nerves, and Senses	..	..	..	..	6	17 0	5	16 3	22	99 10	29	220 0
V. Diseases of the Heart and Blood-vessels	..	..	..	..	1	1 6	1	1 1	7	33 8	6	65 9
VI. Diseases of the Lungs and of the other Organs of Respiration	1	1 5	1	5 5	4	10 10	9	33 4	26	126 1	29	190 5
VII. Diseases of the Stomach, Liver, and other Organs of Digestion	..	..	..	..	1	2 3	3	11 3	14	79 9	25	191 6
VIII. Diseases of the Kidneys, &c.	..	..	..	..	..	..	..	..	5	33 3	2	12 4
IX. Childbirth, Diseases of the Uterus, &c.	..	..	..	..	..	..	3	4 7	..	..	..	..
X. Rheumatism, Diseases of the Bones, Joints, &c.	..	..	..	..	1	7 7	..	..	2	12 6	1	1 1
XI. Diseases of the Skin, Cellular Tissue, &c.	..	..	..	..	1	3 5	..	..	..	..	..	..
XIII. Debility	..	..	..	..	..	..	..	..	..	..	..	..
XV. Age	..	..	..	..	..	..	..	..	..	..	..	..
XVII. Violence, Privation, Cold, and Intemperance	..	..	..	..	2	8 5	7	27 6	9	51 8	10	69 4
I. Small Pox	..	..	..	..	..	..	..	..	..	..	1	13 4
Measles	..	..	..	..	..	..	1	0 2	..	..	..	..
Scarlatina	..	..	..	..	1	3 9	1	2 2	..	..	..	..
Croup	..	..	..	..	..	..	..	..	..	..	..	..
Diarrhœa	..	..	..	..	..	..	..	..	..	..	..	..
Dysentery	..	..	..	..	..	..	..	..	..	..	..	..
Cholera	..	..	..	..	..	..	3	11 1	4	18 6	7	43 8
Influenza	..	..	..	..	..	..	1	0 11	1	8 3	5	26 4
Purpura and Scurvy	..	..	..	..	1	10 7	..	..	..	..	..	..
Ague	..	..	..	..	..	..	1	1 1	..	..	..	..
Typhus	..	..	1	0 2	8	21 2	25	69 0	45	244 11	44	324 10
Metria, or Puerperal Fever	..	..	..	..	..	..	1	1 3	2	24 8	..	..
Rheumatic Fever	..	..	..	..	1	..	5	24 8	4	8 0	3	18 9
Erysipelas	..	..	..	..	..	..	..	..	1	7 2	3	23 11
II. Hæmorrhage	..	..	..	..	1	3 2	1	1 11	4	13 5	7	63 5
Dropsy	..	..	..	..	1	2 4	7	23 7	8	32 11	21	155 7
Ulcer	..	..	..	..	..	..	..	..	..	..	..	..
Mortification	..	..	..	..	..	..	..	..	..	..	..	..
Cancer	..	..	..	..	..	..	1	3 4	4	38 1	5	35 4
Gout	..	..	..	..	..	..	..	..	2	3 4	5	44 3

important element in vital statistics is thus introduced, by which can be seen the facility with which different diseases may engraft themselves on the constitution at different terms of life, or, in other words, the rate at which the deterioration of life takes place from the standard of ordinary health, at different ages, from various diseases; for, with respect to all the lives now under consideration, at the time the assurances were effected, they underwent the usual scrutiny before admission into the Society.

In the following Table will be found an abstract of the number of deaths which have taken place at the various periods of life from different diseases; at the same time setting forth the period which has elapsed, in years and months, from the date of effecting the policies to the date of death:—

XII.

Causes, and Total Duration of Life after Assurance.

AGE.																	
45—49.		50—54.		55—59.		60—64.		65—69.		70—74.		75—79.		80—85.		All Ages.	
No.	Duration.	No.	Duration.	No.	Duration.	No.	Duration.	No.	Duration.	No.	Duration.	No.	Duration.	No.	Duration.	No.	Duration.
	Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.
313	2,551 10	334	2,961 8	363	3,534 3	355	3,834 0	271	3,336 1	139	2,005 11	42	690 1	5	96 4	2,471	22,507 9
312	2,546 3	330	2,935 0	361	3,521 6	355	3,834 0	270	3,328 5	139	2,005 11	42	690 1	5	96 4	2,463	22,455 1
67	507 6	64	557 9	66	571 8	59	641 4	43	528 1	20	278 0	9	145 1	2	39 0	503	4,187 9
49	432 8	46	406 11	66	604 2	72	631 3	47	611 0	25	375 5	8	124 8	..	..	380	3,606 11
66	575 1	67	634 6	54	611 5	49	566 4	20	239 3	5	68 2	..	..	..	..	437	3,513 4
45	367 7	58	529 2	63	600 7	62	726 9	53	654 2	26	378 3	6	103 3	..	..	375	3,712 10
11	85 0	10	112 7	19	149 6	12	139 10	2	31 0	..	..	..	..	..	..	69	619 11
28	189 7	33	197 3	34	379 1	32	356 4	39	465 9	13	168 1	2	31 10	..	..	251	2,155 5
20	138 1	26	250 11	37	397 3	41	419 0	25	309 11	12	187 9	3	53 8	..	..	207	2,052 10
4	44 4	6	47 6	3	21 9	10	127 4	8	92 11	2	21 9	..	..	..	..	40	401 2
5	47 2	1	8 9	..	..	1	10 0	..	..	..	..	..	..	..	..	10	70 6
5	52 0	2	16 0	1	10 10	..	..	..	..	1	14 1	..	..	..	..	13	114 1
1	9 5	1	7 2	..	..	1	19 7	1	9 3	..	..	..	..	..	..	5	48 10
..	..	..	..	1	6 11	..	..	3	44 6	..	..	..	..	..	..	4	51 5
..	..	..	..	..	..	6	65 4	24	295 4	35	514 3	14	231 7	3	57 4	82	1,163 10
11	97 10	16	166 6	17	168 4	10	138 0	5	49 3	..	..	..	..	..	..	87	796 0
1	6 6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	19 10
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0 2
..	..	1	1 1	..	..	..	..	..	..	..	..	..	..	..	..	3	7 0
..	..	1	10 7	..	..	..	..	..	..	..	..	..	..	..	..	1	10 7
..	..	..	..	..	..	1	13 7	..	..	1	14 4	..	..	..	..	2	27 11
4	30 10	5	41 6	1	8 10	4	33 5	3	41 9	1	11 10	1	15 9	..	..	23	205 6
8	75 4	8	97 4	10	84 9	8	111 0	9	111 9	2	37 11	1	20 0	..	..	60	611 4
2	24 7	4	47 9	5	64 6	10	97 10	3	26 3	10	120 11	5	81 1	1	19 1	47	517 6
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	10 7
1	8 9	..	..	6	44 7	2	17 7	..	..	..	..	..	..	..	..	10	72 0
44	327 0	42	343 11	36	290 3	28	286 4	25	308 11	5	62 8	2	28 3	..	..	305	2,307 5
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	25 11
3	14 9	2	13 10	3	24 0	5	71 0	1	13 1	..	..	..	..	1	19 11	28	208 0
4	19 9	1	1 9	4	44 1	1	10 7	2	26 4	1	20 4	..	..	..	..	17	153 11
6	46 8	3	24 3	6	72 6	4	40 9	1	14 6	..	..	1	9 11	..	..	34	290 6
27	241 11	29	239 8	43	414 6	45	376 1	31	407 2	15	221 9	5	85 3	..	..	232	2,205 11
..	..	..	..	1	7 5	..	..	..	..	..	..	..	..	..	..	1	7 5
..	..	3	27 11	..	..	2	18 4	1	5 5	2	37 2	..	..	..	..	8	88 10
9	93 11	8	85 10	12	108 1	15	128 2	10	133 2	4	57 11	2	29 6	..	..	70	713 4
7	50 2	3	29 3	4	15 1	6	67 11	4	51 9	4	58 9	..	..	..	..	35	320 6

TABLE XII.—

Deaths in the Gotha Life Office from All

CAUSES OF DEATH.	AGE.											
	Under 20.		20—24.		25—29.		30—34.		35—39.		40—44.	
	No.	Duration.	No.	Duration.	No.	Duration.	No.	Duration.	No.	Duration.	No.	Duration.
		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.
III. Scrofula	..	..	..	..	..	..	..	..	..	..	..	..
Tabes Mesenterica	..	..	..	..	..	..	2	9 4	5	29 4	4	39 1
Phthisis, or Consumption	..	..	1	1 2	9	36 5	36	148 8	49	249 10	70	304 9
IV. Cephalitis	..	..	..	..	..	..	2	3 7	4	15 10	4	27 11
Apoplexy	..	..	..	..	4	12 8	..	..	15	65 5	15	109 11
Paralysis	..	..	..	..	1	0 10	..	..	..	..	..	..
Insanity	..	..	..	..	..	..	..	..	1	5 5	1	1 9
Disease of the Brain, &c.	..	..	..	..	1	3 6	3	12 8	2	13 2	9	80 5
V. Pericarditis	..	..	..	..	..	..	..	..	2	8 11	..	..
Aneurism	..	..	..	..	..	..	..	..	1	5 10	1	2 7
Disease of the Heart	..	..	..	..	1	1 6	1	1 1	4	18 11	5	63 2
VI. Laryngitis	..	..	..	..	..	..	..	..	1	1 7	..	..
Bronchitis	..	..	..	..	..	..	..	..	1	0 2	..	..
Pneumonia	1	1 5	1	5 5	4	10 10	9	33 4	23	119 11	29	190 5
Asthma	..	..	..	..	..	..	..	..	..	..	..	..
Disease of Lungs	..	..	..	..	..	..	..	..	1	4 5	..	..
VII. Quinsey	..	..	..	..	..	..	..	..	1	4 4	1	1 5
Gastritis	..	..	..	..	..	..	..	..	..	..	1	5 7
Enteritis	..	..	..	..	..	..	..	..	1	7 10	3	17 11
Peritonitis	..	..	..	..	1	2 3	2	9 1	5	24 3	3	28 4
Ascites	..	..	..	..	..	..	..	..	..	..	1	7 2
Ulceration of Intestines, &c.	..	..	..	..	..	..	..	..	1	6 7	..	..
Hernia	..	..	..	..	..	..	..	..	..	..	..	..
Ileus	..	..	..	..	..	..	..	..	..	..	..	..
Intussusception	..	..	..	..	..	..	..	..	..	..	..	..
Stricture of Intestinal Canal	..	..	..	..	..	..	..	..	..	..	..	..
Disease of Stomach, &c.	..	..	..	..	..	..	..	..	4	31 6	4	34 9
Hepatitis	..	..	..	..	..	..	1	2 2	1	4 7	4	28 10
Jaundice	..	..	..	..	..	..	..	..	..	..	1	12 0
Disease of Liver	..	..	..	..	..	..	..	..	1	0 8	7	55 6
Disease of Spleen	..	..	..	..	..	..	..	..	..	..	..	..
VIII. Nephritis	..	..	..	..	..	..	..	..	..	..	..	..
Nephria, or Bright's Disease	..	..	..	..	..	..	..	..	3	23 3	1	1 7
Diabetes	..	..	..	..	..	..	..	..	1	0 11	1	10 9
Stone	..	..	..	..	..	..	..	..	..	..	..	..
Cystitis	..	..	..	..	..	..	..	..	..	..	..	..
Disease of Kidneys, &c.	..	..	..	..	..	..	..	..	1	9 1	..	..
X. Arthritis	..	..	..	..	1	7 7	..	..	1	6 6	..	..
Rheumatism	..	..	..	..	..	..	..	..	1	6 0	1	1 1
Disease of Joints, &c.	..	..	..	..	..	..	..	..	..	..	..	..
XI. Phlegmon	..	..	..	..	..	..	..	..	..	..	..	..
Disease of Skin, &c.	..	..	..	..	1	3 5	..	..	..	..	..	..
XII. Hanging, &c.	..	..	..	..	..	..	..	..	..	..	1	9 4
Fractures	..	..	..	..	..	..	..	..	..	..	..	..
Wounds	..	..	..	..	..	..	..	..	..	..	..	..
Other Violence	..	..	..	..	2	8 5	7	27 6	9	51 8	9	60 0
Causes not specified	..	..	..	..	..	..	..	..	..	..	..	..

The preceding Table will be useful to enable those interested in the facts contained in it to effect other combinations which may suggest themselves; but Table XIII, which is deduced from it, is more particularly applicable to the immediate question,

ontinued).

uses, and Total Duration of Life after Assurance.

AGE.																			
45—49.		50—54.		55—59.		60—64.		65—69.		70—74.		75—79.		80—85.		All Ages.			
No.	Duration.	No.	Duration.	No.	Duration.	No.	Duration.	No.	Duration.	No.	Duration	No.	Duration.	No.	Duration.	No.	Duration.		
	Yrs. Ms		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		
2	5 3	1	15 2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	20 5
1	4 4	1	4 11	6	61 6	6	61 4	6	64 5	1	11 9	..	..	..	..	..	..	32	286 0
63	565 6	65	614 5	48	549 11	43	505 0	14	174 10	4	56 5	..	..	..	..	..	..	402	3,206 11
6	58 7	3	19 2	2	16 9	3	31 5	3	35 5	1	15 1	..	..	..	..	..	..	28	223 9
34	270 11	38	360 10	50	475 11	48	566 9	45	560 8	19	275 1	6	103 3	..	..	..	..	274	2,734 11
1	1 2	3	19 0	1	8 2	1	13 1	3	36 11	2	25 8	..	..	..	..	..	..	12	104 10
..	..	3	18 3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	25 5
4	36 11	11	111 11	10	99 9	10	115 6	2	21 2	4	62 5	..	..	..	..	..	..	56	557 3
..	..	2	13 7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	22 6
1	5 8	..	..	1	8 4	..	..	..	..	..	..	..	..	..	..	..	..	4	22 5
10	79 4	8	99 0	18	141 2	12	139 10	2	30 1	..	..	..	..	..	..	..	..	61	574 1
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1 7
1	15 1	..	..	2	26 1	5	53 10	..	..	..	..	..	..	..	..	..	..	9	95 2
25	157 11	33	197 3	30	332 2	22	247 11	37	432 7	12	152 7	2	31 10	..	..	..	..	229	1,945 3
..	..	..	..	..	..	2	23 6	2	33 2	1	15 6	..	..	..	..	..	..	5	72 2
2	16 7	..	..	2	20 10	2	31 1	..	..	..	..	..	..	..	..	..	..	7	72 11
..	..	1	10 2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	15 11
1	10 1	1	8 3	1	7 8	2	9 9	..	..	..	..	..	..	..	..	..	..	6	41 4
1	8 2	2	20 9	1	10 10	2	7 2	..	..	1	16 6	..	..	..	..	..	..	11	89 2
4	16 9	6	49 3	5	53 4	4	35 2	4	49 4	1	19 1	..	..	..	..	..	..	35	286 10
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	7 2
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	6 7
..	..	..	..	..	..	1	3 3	1	13 6	..	..	..	..	..	..	..	..	2	16 9
..	..	..	..	..	..	..	..	..	..	1	13 0	..	..	..	..	..	..	1	13 0
..	..	..	..	..	..	..	..	..	..	1	13 4	..	..	..	..	..	..	1	13 4
..	..	..	..	1	14 0	1	16 4	1	13 11	..	..	1	13 11	..	..	..	..	4	68 2
7	64 10	7	51 0	13	131 5	11	129 8	9	114 10	3	42 6	1	19 10	..	..	..	..	59	681 2
1	10 2	2	7 4	6	58 0	6	44 10	2	27 1	1	17 1	1	19 11	..	..	..	..	25	220 0
..	..	..	..	2	23 5	3	52 8	..	..	1	14 5	..	..	..	..	..	..	7	102 6
6	28 1	7	59 2	7	83 8	10	118 0	7	83 11	3	51 10	..	..	..	..	..	..	48	542 6
..	..	..	..	1	14 11	1	2 2	1	7 4	..	..	..	..	..	..	..	..	3	24 5
1	7 2	..	..	..	..	1	17 10	..	..	..	..	..	..	..	..	..	..	2	25 0
1	11 3	1	12 8	..	..	1	15 6	1	20 4	..	..	..	..	..	..	..	..	8	84 7
1	11 6	2	15 11	1	9 10	2	25 8	..	..	..	..	..	..	..	..	..	..	8	74 8
..	..	..	..	..	..	..	..	1	10 1	..	..	..	..	..	..	..	..	1	10 1
..	..	..	..	..	..	1	12 2	..	..	..	..	..	..	..	..	..	..	1	12 2
1	14 5	3	18 11	2	11 11	5	56 2	6	62 6	2	21 9	..	..	..	..	..	..	20	194 9
1	17 3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	31 6
3	19 6	2	16 0	1	10 10	..	..	..	..	..	..	..	..	..	..	..	..	8	53 5
1	15 3	..	..	..	..	..	..	..	..	1	14 1	..	..	..	..	..	..	2	29 4
..	..	..	..	..	..	1	19 7	..	..	..	..	..	..	..	..	..	..	1	19 7
1	9 5	1	7 2	..	..	..	..	1	9 3	..	..	..	..	..	..	..	..	4	29 3
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	9 4
..	..	..	..	1	10 3	1	18 9	..	..	..	..	..	..	..	..	..	..	2	29 0
..	..	..	..	1	15 2	..	..	1	6 2	..	..	..	..	..	..	..	..	2	21 4
11	97 10	16	166 6	15	142 11	9	119 3	4	43 1	..	..	..	..	..	..	..	..	82	704 0
1	5 7	4	26 8	2	12 9	..	..	1	7 8	..	..	..	..	..	..	..	..	8	52 8

and differs from Table XII only in giving the average period, instead of the absolute period, which elapsed from the date of assuring to that of death.

TABLE

Deaths in the Gotha Life Office from All

CAUSES OF DEATH.	AGE.											
	Under 20.		20—24.		25—29.		30—34.		35—39.		40—44.	
	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration	No.	Average Duration.
		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.
All Causes	1	1 5	3	2 3	37	3 2	113	3 6	217	5 2	278	6 8
Specified Causes	1	1 5	3	2 3	37	3 2	113	3 6	217	5 2	278	6 8
I. Zymotic Diseases	..	..	1	0 2	10	2 5	38	2 11	60	5 5	64	7 2
SPORADIC DISEASES.												
II. Dropsy, Cancer, and other Diseases of uncertain or variable seat	..	..	..	..	2	2 9	9	3 2	18	4 10	38	7 7
III. Tubercular Diseases	..	..	1	1 2	9	4 0	38	4 1	54	5 2	74	4 8
IV. Diseases of the Brain, Spinal Marrow, Nerves, and Senses	..	..	..	..	6	2 10	5	3 3	22	4 6	29	7 7
V. Diseases of the Heart and Blood-vessels	..	..	..	..	1	1 6	1	1 1	7	4 9	6	10 11
VI. Diseases of the Lungs and of the other Organs of Respiration	1	1 5	1	5 5	4	2 8	9	3 8	26	4 10	29	6 7
VII. Diseases of the Stomach, Liver, and other Organs of Digestion	..	..	..	..	1	2 3	3	3 0	14	5 8	25	7 8
VIII. Diseases of the Kidneys, &c.	..	..	..	..	..	..	..	..	5	6 7	2	6 2
IX. Childbirth, Diseases of the Uterus, &c.	..	..	..	..	..	..	3	1 6	..	..	..	..
X. Rheumatism, Diseases of the Bones, Joints, &c.	..	..	..	..	1	7 7	..	..	2	6 3	1	1 1
XI. Diseases of the Skin, Cellular Tissue, &c.	..	..	..	..	1	3 5	..	..	..	..	..	..
XIII. Debility	..	..	..	..	..	..	..	..	..	..	..	..
XV. Age	..	..	..	..	..	..	..	..	..	..	..	..
XVII. Violence, Privation, Cold, and Intemperance	..	..	..	..	2	4 2	7	3 11	9	5 8	10	6 11
I. Small Pox	..	..	..	..	..	..	..	..	..	..	1	13 4
Measles	..	..	..	..	..	..	1	0 2	..	..	..	..
Scarlatina	..	..	..	..	1	3 9	1	2 2	..	..	..	..
Croup	..	..	..	..	..	..	..	..	..	..	..	..
Diarrhœa	..	..	..	..	..	..	..	..	..	..	..	..
Dysentery	..	..	..	..	..	..	..	..	3	4 8	1	7 5
Cholera	..	..	..	..	..	..	3	3 8	4	4 7	7	6 2
Influenza	..	..	..	..	..	..	1	1 11	1	8 3	5	5 3
Purpura and Scurvy	..	..	..	..	..	..	..	..	..	..	..	..
Ague	..	..	..	..	..	..	1	1 1	..	..	..	..
Typhus	..	..	1	0 2	8	2 7	25	2 9	45	5 5	44	7 4
Metria, or Puerperal Fever	..	..	..	..	..	..	1	1 3	2	12 4	..	..
Rheumatic Fever	..	..	..	..	1	..	5	4 11	4	2 0	3	6 3
Erysipelas	..	..	..	..	..	..	..	..	1	7 2	3	7 11
II. Hæmorrhage	..	..	..	..	1	3 2	1	1 11	4	3 4	7	9 1
Dropsy	..	..	..	..	1	2 4	7	3 4	8	4 1	21	7 5
Ulcer	..	..	..	..	..	..	..	..	..	..	..	..
Mortification	..	..	..	..	..	..	..	..	..	..	..	..
Cancer	..	..	..	..	..	..	1	3 4	4	9 6	5	7 1
Gout	..	..	..	..	..	..	..	..	2	1 8	5	8 10
III. Scrofula	..	..	..	..	..	..	..	..	..	..	..	..
Tabes Mesenterica	..	..	..	..	..	..	2	4 8	5	5 10	4	9 9
Phthisis, or Consumption	..	..	1	1 2	9	4 1	36	4 2	49	5 1	70	4 4
IV. Cephalitis	..	..	..	..	..	..	2	1 9	4	4 0	4	7 0
Apoplexy	..	..	..	..	4	3 2	..	..	15	4 4	15	7 4
Paralysis	..	..	..	..	1	0 10	..	..	..	..	..	..
Insanity	..	..	..	..	..	..	..	..	1	5 5	1	1 9
Disease of the Brain, &c.	..	..	..	..	1	3 6	3	4 3	2	6 7	9	8 11
V. Pericarditis	..	..	..	..	..	..	..	..	2	4 5	..	..
Aneurism	..	..	..	..	..	..	..	..	1	5 10	1	2 7
Disease of Heart	..	..	..	..	1	1 6	1	1 1	4	4 9	5	12 8
VI. Laryngitis	..	..	..	..	..	..	..	..	1	1 7	..	..
Bronchitis	..	..	..	..	..	..	..	..	1	0 2	..	..
Pneumonia	1	1 5	1	5 5	4	2 9	9	3 8	23	5 9	29	6 7
Asthma	..	..	..	..	..	..	..	..	..	..	..	..
Disease of Lungs	..	..	..	..	..	..	..	..	1	4 5	..	..

III.

uses, and Average Duration.

	AGE.																					
	45—49.		50—54.		55—59.		60—64.		65—69.		70—74.		75—79.		80—85.		All Ages.	
	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.
		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.
3	334	8 2	334	8 10	363	9 8	355	10 10	271	12 4	139	14 9	42	16 6	5	19 3	2,471	9 1
2	330	8 2	330	8 11	361	9 9	355	10 10	270	12 4	139	14 9	42	16 6	5	19 3	2,463	9 1
7	64	7 7	64	8 9	66	8 8	59	10 1	43	12 3	20	13 5	9	16 1	2	19 6	503	8 4
9	46	8 10	46	8 10	66	9 2	72	8 9	47	13 0	25	15 0	8	15 7	..	..	380	9 6
6	67	8 9	67	9 6	54	11 4	49	11 7	20	12 0	5	13 7	..	..	..	..	437	8 0
5	58	8 2	58	9 2	63	9 6	62	11 8	53	12 4	26	14 7	6	17 2	..	..	375	9 2
1	10	7 9	10	11 3	19	7 10	12	11 8	2	15 6	..	..	..	..	..	..	69	9 0
8	33	6 5	33	6 0	34	11 2	32	11 2	39	11 11	13	12 11	2	15 11	..	..	251	8 7
0	26	6 11	26	9 8	37	10 9	41	10 3	25	12 4	12	15 8	3	17 10	..	..	207	9 1
4	6	11 1	6	7 11	3	7 3	10	12 8	8	11 7	2	10 10	..	..	..	..	40	10 0
5	1	9 5	1	8 9	..	..	1	10 0	..	..	..	..	..	..	..	..	10	7 1
5	2	10 4	2	8 0	1	10 10	1	14 1	..	..	..	..	..	..	..	..	13	8 9
1	1	9 5	1	7 2	..	..	1	19 7	1	9 3	..	..	..	..	..	..	5	9 9
.	..	..	..	..	1	6 11	..	..	3	14 10	..	..	..	..	..	..	4	14 4
.	..	..	..	..	..	..	6	10 10	24	12 4	35	14 11	14	16 7	3	19 1	82	44 2
1	16	8 11	16	10 5	17	7 11	10	13 10	5	9 10	..	..	..	..	..	..	87	8 10
1	..	6 6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	9 11
.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0 2
.	..	..	1	1 1	..	..	..	..	..	..	..	..	..	..	..	..	3	2 4
.	..	..	1	10 7	..	..	..	..	..	..	..	..	..	..	..	..	1	10 7
.	..	..	..	..	..	..	1	13 7	..	..	1	14 4	..	..	..	..	2	13 11
4	7	8	5	8 3	1	8 10	4	8 4	3	13 11	1	11 10	1	15 9	..	..	23	8 11
8	9	5	8	12 2	10	8 5	8	13 10	9	12 5	2	18 11	1	20 0	..	..	60	10 2
2	12	3	4	11 11	5	12 10	10	9 9	3	8 9	10	12 1	5	16 2	1	19 1	47	11 0
.	..	..	..	..	1	10 7	..	..	..	..	..	..	..	..	..	..	1	10 7
1	8	9	..	..	6	7 4	2	8 9	..	..	..	..	..	..	..	..	10	7 2
4	7	5	42	8 2	36	8 0	28	10 2	25	12 4	5	12 6	2	14 2	..	..	305	7 9
.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	8 8
3	4	11	2	6 11	3	8 0	5	14 2	1	13 1	..	..	..	..	1	19 11	28	7 5
4	4	11	1	1 9	4	11 0	1	10 7	2	13 2	1	20 4	..	..	..	..	17	9 1
6	7	9	3	8 1	6	12 1	4	10 2	1	14 6	..	..	1	9 11	..	..	34	8 7
7	9	0	29	8 3	43	9 8	45	8 4	31	13 2	15	14 9	5	17 1	..	..	232	9 7
.	..	..	..	..	1	7 5	..	..	..	..	..	..	..	..	..	..	1	7 5
.	..	..	3	9 4	..	..	2	9 2	1	5 5	2	18 7	..	..	..	..	8	11 1
9	10	5	8	10 9	12	9 0	15	8 7	10	13 4	4	14 6	2	14 9	..	..	70	10 2
7	7	2	3	9 9	4	3 9	6	11 4	4	12 11	4	14 8	..	..	..	..	35	9 2
2	2	7	1	15 2	..	..	..	..	..	..	..	..	..	..	..	..	3	6 10
1	4	4	1	4 11	6	10 3	6	10 3	6	10 9	1	11 9	..	..	..	..	32	8 11
3	9	0	65	9 5	48	11 5	43	11 9	14	12 6	4	14 1	..	..	..	..	402	8 0
6	9	9	3	6 4	2	8 4	3	10 6	3	11 10	1	15 1	..	..	..	..	28	8 0
4	8	0	38	9 6	50	9 6	48	11 10	45	12 6	19	14 6	6	17 3	..	..	274	10 0
1	1	2	3	6 4	1	8 2	1	13 1	3	12 4	2	12 10	..	..	..	..	12	8 9
.	..		3	6 1	..	..	..	..	..	..	..	..	..	..	..	..	5	5 1
4	9	3	11	10 2	10	10 0	10	11 7	2	10 7	4	15 7	..	..	..	..	56	7 11
.	..		2	6 9	..	..	..	..	..	..	..	..	..	..	..	..	4	5 7
1	5	8	..	..	1	8 4	..	..	..	..	..	..	..	..	..	..	4	5 7
0	7	11	8	12 5	18	17 10	12	11 8	2	15 0	..	..	..	..	..	..	61	9 5
.	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1 7
1	15	1	..	..	2	13 0	5	10 9	..	..	..	..	..	..	..	..	9	10 7
5	6	3	33	5 11	30	11 1	23	10 9	37	11 8	12	12 9	2	15 11	..	..	229	8 4
.	..		..	..	..	..	2	11 9	2	16 7	1	15 6	..	..	..	..	5	14 5
2	8	3	..	..	2	10 5	2	15 7	..	..	..	..	..	..	..	..	7	10 5

TABLE XIII.—

Deaths in the Gotha Life Office from All

CAUSES OF DEATH.	AGE.											
	Under 20.		20—24.		25—29.		30—34.		35—39.		40—44.	
	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.
		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.
VII. Quinsey	..	..	..	..	..	..	..	..	1	4 4	1	1 5
Gastritis	..	..	..	..	..	..	..	..	..	..	1	5 7
Enteritis	..	..	..	..	..	..	..	..	1	7 10	3	5 11
Peritonitis	..	..	..	..	1	2 3	2	4 7	5	4 10	3	9 5
Ascites	..	..	..	..	..	..	..	..	..	..	1	7 2
Ulceration of Intestines, &c.	..	..	..	..	..	..	..	..	1	6 7	..	..
Hernia	..	..	..	..	..	..	..	..	..	..	..	..
Ileus	..	..	..	..	..	..	..	..	..	..	..	..
Intussusception	..	..	..	..	..	..	..	..	..	..	..	..
Stricture of Intestinal Canal	..	..	..	..	..	..	..	..	..	..	..	..
Disease of Stomach, &c.	..	..	..	..	..	..	..	..	4	7 10	4	8 8
Hepatitis	..	..	..	..	..	..	1	2 2	1	4 7	4	7 3
Jaundice	..	..	..	..	..	..	..	..	..	..	1	12 0
Disease of Liver	..	..	..	..	..	..	..	..	1	0 8	7	7 11
Disease of Spleen	..	..	..	..	..	..	..	..	..	..	..	..
VIII. Nephritis	..	..	..	..	..	..	..	..	..	..	..	..
Nephria, or Bright's Disease	..	..	..	..	..	..	..	..	3	7 9	1	1 7
Diabetes	..	..	..	..	..	..	..	..	1	0 11	1	10 9
Stone	..	..	..	..	..	..	..	..	..	..	..	..
Cystitis	..	..	..	..	..	..	..	..	..	..	..	..
Disease of Kidneys, &c.	..	..	..	..	..	..	..	..	1	9 1	..	..
X. Arthritis	..	..	..	..	1	7 7	..	..	1	6 6	..	..
Rheumatism	..	..	..	..	..	..	..	..	1	6 0	1	1 1
Disease of Joints, &c.	..	..	..	..	..	..	..	..	..	..	..	..
XI. Phlegmon	..	..	..	..	..	..	..	..	..	..	..	..
Disease of Skin, &c.	..	..	..	..	1	3 5	..	..	..	..	..	..
XII. Hanging, &c.	..	..	..	..	..	..	..	..	..	..	1	9 4
Fractures	..	..	..	..	..	..	..	..	..	..	..	..
Wounds	..	..	..	..	..	..	..	..	..	..	..	..
Other Violence	..	..	..	..	2	4 2	7	3 11	9	5 8	9	6 8
Causes not specified	..	..	..	..	..	..	..	..	..	..	..	..

In this Table it will be found that the causes of death are unspecified in eight only out of the 2471 cases recorded. The results herein given are so novel, but yet so varied that it will be impossible to discuss them fully within the limits of this paper, and only the most obvious will therefore be brought under consideration. In Abstract C, preceding, it was seen that, measuring the period which elapsed from the date of effecting the policies to the date of death, the interval was less for young lives than for older ones; and here, by adopting the opposite test, of measuring the interval from the date of death to the date of assuring, the same law is found to prevail, although in a more remarkable degree; and this difference is evidently owing to the circumstance, that all deaths among policies of long standing must necessarily be included in the more advanced periods of life in Table XIII, but included in younger periods of life in Abstract C. However, as the same law shews itself in both classes of results, and differing only in degree, the

(continued).

Causes, and Average Duration.

AGE.

45—49.		50—54.		55—59.		60—64.		65—69.		70—74.		75—79.		80—85.		All Ages.	
No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.	No.	Average Duration.
	Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.		Yrs. Ms.
..	..	1	10 2	..	..	..	..	..	..	..	..	..	..	..	..	3	5 4
1	10 1	1	8 3	1	7 8	2	4 11	..	..	..	..	..	..	..	..	6	6 11
1	8 2	2	10 5	1	10 10	2	3 7	..	..	1	16 6	..	..	..	..	11	8 1
4	4 2	6	8 2	5	10 8	4	8 9	4	12 4	1	19 1	..	..	..	..	35	8 2
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	7 2
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	6 7
..	..	..	..	..	..	1	3 3	1	13 6	..	..	..	..	..	..	2	8 4
..	..	..	..	..	..	..	..	..	..	1	13 0	..	..	..	..	1	13 0
..	..	..	..	..	..	..	..	..	..	1	13 4	..	..	..	..	1	13 4
..	..	..	..	1	14 0	1	16 4	1	13 4	..	..	1	13 11	..	..	4	14 6
7	9 3	7	7 3	13	10 1	11	11 8	4	12 8	3	14 2	1	19 10	..	..	59	10 6
1	10 2	2	3 8	6	9 8	6	7 6	2	13 7	1	17 1	1	19 11	..	..	25	8 10
..	..	..	..	2	11 9	3	14 3	..	..	1	14 5	..	..	..	..	7	14 8
6	4 8	7	8 5	7	11 11	10	11 10	7	12 0	3	17 3	..	..	..	..	48	10 0
..	..	..	..	1	14 11	1	2 2	1	7 4	..	..	..	..	..	..	3	8 2
1	7 2	..	..	..	..	1	17 10	..	..	..	..	..	..	..	..	2	12 6
1	11 3	1	12 8	..	..	1	15 6	1	20 4	..	..	..	..	..	..	8	10 7
1	11 6	2	7 11	1	4 11	2	12 10	..	..	..	..	..	..	..	..	8	9 4
..	..	..	..	..	..	..	..	1	10 1	..	..	..	..	..	..	1	10 1
..	..	..	..	..	..	1	12 2	..	..	..	..	..	..	..	..	1	12 2
1	14 5	3	9 6	2	6 0	5	11 3	6	10 5	2	10 11	..	..	..	..	20	9 9
1	17 3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	10 6
3	6 6	2	16 0	1	10 0	..	..	..	..	..	..	..	..	..	..	8	6 8
1	15 3	..	..	..	..	..	..	..	..	1	14 1	..	..	..	..	2	14 8
..	..	..	..	..	..	1	19 7	..	..	..	..	..	..	..	..	1	19 7
1	9 5	1	7 2	..	..	..	..	1	9 3	..	..	..	..	..	..	4	7 4
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	9 4
..	..	..	..	1	10 3	1	18 9	..	..	..	..	..	..	..	..	2	14 6
..	..	..	..	1	15 2	..	..	1	6 2	..	..	..	..	..	..	2	10 8
11	8 11	16	10 5	15	9 7	9	13 3	4	10 9	..	..	..	..	..	..	82	8 7
1	5 7	4	6 8	2	6 4	..	..	1	7 8	..	..	..	..	..	..	8	6 7

greater weight is thereby given to the unexpected principles disclosed, and should lead those connected with the management of life offices to the serious consideration of the financial questions which so obviously arise out of the results. From the relatively high rate of mortality at the more advanced ages, than at the younger ages, among assured lives, compared with those of the community generally, an opinion almost universally prevails, that there must be a loss, instead of a profit, connected with the transactions on old lives, and in consequence a number of life offices will not assure the lives of old persons. But if the ratio of lapsed policies, as set forth in Table XV,—and the ratio is much higher in this country,—be viewed in connection with the most remarkable law disclosed in Abstract C and Table XIII, there can no longer be any doubt that the general opinion is a most fallacious one, and unfortunately prevails to the serious detriment of the older class of lives, to whom, in pecuniary transactions, the principles of life assurance

are more strictly applicable than any other. Apart from statistical evidence, it must be sufficiently obvious, on an attentive consideration of the doctrine of probabilities, that in guaranteeing any event connected with the law of averages, the nearer to unity the chances of the contingency taking place be, the less the hazard of any adventure on the result. And if to this general principle be added the incidental pecuniary advantages arising from the moral influences and considerations which bear on the prosperity of a life office, the absurdity of the prejudice which prevails against assuring old lives must immediately appear. The following shews the results for six of the principal classes of disease:—

ABSTRACT K.

Average Period elapsed from the Date of Assuring to the Date of Death, among Persons Dying at the following Ages.—Gotha Life Office.

DISEASE.	25 to 29.		30 to 34.		35 to 39.		40 to 44.		45 to 49.		50 to 54.		55 to 59.		60 to 64.		65 to 69.		70 to 74.		75 to 79.		All Ages.	
	Years.	Months.	Years.	Months.	Years.	Months.	Years.	Months.	Years.	Months.	Years	Months.	Years	Months.	Years.	Months	Years.	Months.	Years.	Months.	Years.	Months.	Years.	Months.
All Diseases	3	2	3	6	5	2	6	8	8	2	8	10	9	8	10	10	12	4	14	9	16	6	9	1
I. Zymotic Diseases	2	5	2	11	5	5	7	2	7	7	8	9	8	8	10	1	12	3	13	5	16	1	8	4
II. Dropsy, Cancer, and other Diseases of uncertain or variable seat	2	9	3	2	4	10	7	7	8	10	8	10	9	2	8	9	13	..	15	..	15	7	9	6
III. Tubercular Diseases	4	..	4	1	5	2	4	8	8	9	9	6	11	4	11	7	12	..	13	7	..	..	8	..
IV. Diseases of the Spinal Marrow, Nerves, and Senses	2	10	3	3	4	6	7	7	8	2	9	2	9	6	11	8	12	4	14	7	17	2	9	2
VI. Diseases of the Lungs and of the other Organs of Respiration	2	8	3	8	4	10	6	7	6	5	6	..	11	2	11	2	11	11	12	11	15	11	8	7
VII. Diseases of the Stomach, Liver, and other Organs of Respiration	2	3	3	9	5	8	7	8	6	11	9	8	10	9	10	3	12	4	15	8	17	10	9	1

Of the diseases in class I, namely, the zymotic diseases, it will be seen that the duration of the assurances on the lives falling by this class of disease, is less at every age than the average from all causes, except at the term of life 35–44; and it will likewise be seen, that for all ages taken collectively, the duration of the policies lapsing from these diseases is less than the average duration of all policies.

The same observation does not apply to class II. Under age 40, the duration of the policies is less than the average; but in the term of life 40–54, greater; the succeeding ten years again less; and in the term 65–74, greater; but for all ages collectively, the duration of policies becoming claims on account of death from this group of diseases, is five months' greater than the average.

In group III, which includes the tubercular diseases, it will be seen, that for all ages under 60, with the exception of the quinquennial term, 40–44, the period elapsed from the date of assuring to the date of death is above the average of the period connected with the deaths from all causes; shewing that, for those ages, the deaths of this class, which consists chiefly of phthisis, must be induced by a disease slow in its operation, and in that respect differing from the characteristic of group I. In respect to one term of life, 40–44, the deaths taking place therein, from this group of diseases, have followed very rapidly on the date of the lives being assured, and so remarkably so, as to reduce the average, at all ages collectively, from this disease, more than one year below the average from all causes. At the term of life 40–44, the period elapsed in the deaths from

all causes is 6 years 8 months, but in the group of tubercular diseases, it is only 4 years 8 months; and this would appear to be a true feature of the disease, for the greatest number of deaths have taken place at this term of life; at the other terms of life, when the opposite feature prevails, up to age 60, the result is constantly above the average. On referring to the details of group III, it will be found that these peculiar results are due wholly to the deaths from phthisis, and therefore the preceding observations are strictly applicable to that disease only.

Group IV contains the diseases of the nervous system, and it will be seen that the results do not differ widely from those for all causes; and the same remark applies to the deaths from apoplexy, which form a large proportion of this section.

On referring to group VI, which represents the other diseases of the lungs and of the organs of respiration, it will be seen that, with the exception of the decennial term of life, 55–64, the deaths take place in a shorter time after the date of assuring than in the average of the deaths from all causes, and in the aggregate of all the ages, the difference is six months. These results are due chiefly to the deaths from pneumonia, which constitute 229 out of the 251 deaths of this group. And it will further be seen, that the deaths from asthma have taken place at a period prolonged beyond the average.

In regard to the diseases enumerated in group VII, it will be found that, on the average, they agree in their results with the deaths from all causes; and that in the different quinquennial terms of life, the results are in some instances above, and in others below, the average.

If attention be now directed to the rate of mortality from the various specified causes given in Table XIII, it will be found that, for all ages taken collectively, the greatest mortality has resulted from zymotic diseases, or those forming group I; and next, tubercular diseases, or group III, which are here separated from the other diseases of the lungs and organs of respiration, which form a distinct class in group VI. The following Table is an abstract of the results in Table XIII, so far as concerns the rate of mortality; and it will be observed that the rate of mortality from the zymotic diseases does not differ widely between ages 31–50; but from that age upwards, a rapid and uniform rate of increase takes place:—In group II, including dropsy, cancer, &c., there is a uniform rate of increase from the younger to the older ages. In the class of tubercular diseases, there is not much difference in the rate of mortality between ages 31–50; but in the next three quinquennial terms of life, there is a gradual increase. In group IV, there will be observed a very great difference between the rate of mortality at the younger and more advanced ages; of the 375 deaths in this group, 274 consist of deaths from apoplexy, and the results are therefore conformable to those already described in connection with Table XI, preceding. The results of group VI resemble in their relation those in connection with group III. Group VII, it will be observed, resembles the results of group IV, in having a very low rate of mortality at the earlier ages, and increasing rapidly at the more advanced terms of life.

TABLE XIV, *deduced from* TABLE XIII.

Age.	Number of Persons Assured.	All Causes.		I. Zymotic Diseases.		II. Dropsy, Cancer, and other Diseases of uncertain seat.		III. Tubercular Diseases.		IV. Diseases of Brain, Spinal Marrow, Nerves, and Senses.	
		Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.
15 to 25	1,233	4	·324	1	·081	..	..	1	·081	..	..
26 .. 30	5,595	37	·661	10	·179	2	·036	9	·161	6	·107
31 .. 35	13,136	113	·860	38	·289	9	·069	38	·289	5	·038
36 .. 40	20,734	217	1·047	60	·289	18	·087	54	·260	22	·106
41 .. 45	24,503	278	1·135	64	·261	38	·155	74	·303	29	·118
46 .. 50	22,507	313	1·394	67	·298	49	·218	66	·293	45	·200
51 .. 55	18,025	334	1·853	64	·355	46	·255	67	·372	58	·322
56 .. 60	13,035	363	2·785	66	·506	66	·506	54	·414	63	·483
61 .. 65	8,324	355	4·265	59	·709	72	·865	49	·589	62	·745
66 .. 70	4,058	271	6·678	43	1·060	47	1·158	20	·493	53	1·306
71 .. 80	1,719	181	10·529	29	1·687	33	1·920	5	·291	32	1·862
All Ages..	132,869	2,466	1·856	501	·377	380	·286	437	·329	375	·282

Age.	Number of Persons Assured.	V. Diseases of the Heart and Blood Vessels.		VI. Diseases of the Lungs and Organs of Respiration.		VII. Diseases of the Stomach, Liver and other Organs of Digestion.		VIII. Diseases of the Kidneys, &c.		IX. Childbirth, Diseases of the Uterus, &c.	
		Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.	Deaths	Mortality per Cent.	Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.
15 to 25	1,233	..	..	2	·162	..	..	..	..	..	..
26 .. 30	5,595	1	·018	4	·071	1	·018	..	..	..	..
31 .. 35	13,136	1	·008	9	·069	3	·023	..	..	3	·023
36 .. 40	20,734	7	·034	26	·125	14	·068	5	·024	..	..
41 .. 45	24,503	6	·024	29	·118	25	·102	2	·008	..	..
46 .. 50	22,507	11	·049	28	·124	20	·089	4	·018	5	0·22
51 .. 55	18,025	10	·056	33	·183	26	·144	6	·033	1	·006
56 .. 60	13,035	19	·146	34	·261	37	·283	3	·023	..	..
61 .. 65	8,324	12	·144	32	·384	41	·493	10	·120	1	·012
66 .. 70	4,058	2	·049	39	·961	25	·616	8	·197	..	..
71 .. 80	1,719	..	..	15	·873	15	·873	2	·116	..	..
All Ages..	132,869	69	·052	251	·189	207	·156	40	·030	10	·008

Age.	Number of Persons Assured.	X. Rheumatism, Diseases of the Bones, &c.		XI. Diseases of the Skin, Cellular Tissue, &c.		XIII. Debility.		XV. Old Age.		XVII. Violence, Privation, Cold & Intemperance.	
		Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.
15 to 25	1,233	..	..	..	..	..	..	..	..	..	..
26 .. 30	5,595	1	·018	1	·018	..	..	..	..	2	·036
31 .. 35	13,136	..	..	..	..	..	..	..	..	7	·053
36 .. 40	20,734	2	·010	..	..	..	..	..	..	9	·044
41 .. 45	24,503	1	·004	..	..	..	..	..	..	10	·041
46 .. 50	22,507	5	·022	1	·004	..	..	..	..	11	·049
51 .. 55	18,025	2	·010	1	·006	..	..	..	..	16	·089
56 .. 60	13,035	1	·008	..	..	1	·008	..	..	17	·130
61 .. 65	8,324	1	·012	1	·012	..	..	6	·070	10	·120
66 .. 70	4,058	..	..	1	·025	3	·074	24	·591	5	·123
71 .. 80	1,719	..	..	..	..	..	..	49	2·850	..	..
All Ages..	132,869	13	·010	5	·004	4	·003	79	·059	87	·065

The preceding remarks have been made on six only of the principal groups of diseases, and the following still more condensed Abstract of the results may be interesting. The Roman numerals represent the diseases as grouped in the preceding Table and in Table XIII.

Diseases arranged according to the order of their Intensity at the following Ages.

31—35.	36—40.	41—45.	46—50.	51—55.	56—60.	61—65.	66—70.	71—80.
I	I	III	I	III	I	II	IV	II
III	III	I	III	I	II	IV	II	IV
II	VI	II	II	IV	IV	I	I	I
VI	IV	IV	IV	II	III	III	VI	VI
IV	II	VI	VI	VI	VII	VII	VII	VII
VII	VII	VII	VII	VII	VI	VI	III	III

In the above, as in Table XI, it will be seen that, at the earlier ages, the intensity of the zymotic diseases, and also tubercular disease, is greatest; but at the more advanced, a gradual falling off will be observable in the class of tubercular disease. In the term of life 56–65, tubercular disease stands fourth in the order of intensity, and in the term 66–80, last in order. Again, with respect to class IV, which consists, to a great extent, of deaths from apoplexy, it will be observed that, in the period of life 36–50, it stands fourth in the order of intensity; but that in each of the three succeeding quinquennial terms of life it gradually advances one step in the order of intensity, until, at the term 66–70, it is highest in intensity. This assimilates strictly with the results at pp. 170, 171 preceding. The class of pulmonary diseases, however, or diseases of the respiratory organs, not only in Table XI, but in the Abstracts given in pages 169 and 171, as well as in the earlier Reports of the Registrar-General, included group III, and also group VI; and if the results be viewed in accordance with this arrangement, the diseases of the respiratory organs will be found to take precedence of all others between ages 31–70, and in the term of life 70–80, they will stand fourth in order.

With the view to shew the relative intensity of the various groups of disease at different terms of life amongst different populations, the following Abstracts, deduced from facts presented in the Reports of the Registrar-General, are given:—

Abstract L.

Mortality of Kent.—Males.

Age.	CAUSES OF DEATH.							
	All Causes.		I. Zymotic Diseases.		II. Diseases of uncertain or variable seat.		III. Diseases of the Nervous System.	
	Number of Deaths.	Mortality per Cent.	Number of Deaths.	Mortality per Cent.	Number of Deaths.	Mortality per Cent.	Number of Deaths.	Mortality per Cent.
15 to 19	185	·797	33	·142	18	·078	14	·060
20 ... 24	250	1·165	50	·233	12	·056	14	·065
25 ... 29	198	1·196	32	·193	12	·072	11	·066
30 ... 34	183	1·156	31	·156	13	·082	22	·139
35 ... 39	171	1·368	15	·119	17	·135	18	·143
40 ... 44	174	1·373	26	·205	17	·134	32	·253
45 ... 49	147	1·571	12	·128	23	·246	23	·246
50 ... 54	178	1·845	24	·256	19	·202	22	·234
55 ... 59	148	2·461	12	·200	29	·482	24	·408
60 ... 64	220	3·393	20	·308	44	·679	33	·509
65 ... 69	231	5·558	22	·529	33	·794	44	1·059
70 ... 74	293	8·386	18	·515	46	·831	54	1·546
75 ... 79	228	11·820	18	·933	28	1·452	26	1·348
All Ages ...	2,607	1·821	313	·219	311	·217	337	·235

Age.	CAUSES OF DEATH.							
	IV. Diseases of the Respiratory Organs.		V. Diseases of the Organs of Circulation.		VI. Diseases of the Digestive Organs.		VII. Diseases of the Urinary Organs.	
	Number of Deaths.	Mortality per Cent.	Number of Deaths.	Mortality per Cent.	Number of Deaths.	Mortality per Cent.	Number of Deaths.	Mortality per Cent.
15 to 19	72	·310	7	·030	7	·030	1	·004
20 ... 24	125	·583	5	·023	12	·056	2	·009
25 ... 29	109	·658	5	·030	12	·072	...	...
30 ... 34	90	·568	7	·044	4	·025	2	·013
35 ... 39	75	·597	9	·072	13	·103	4	·032
40 ... 44	60	·474	9	·071	10	·079	3	·024
45 ... 49	53	·566	6	·064	13	·139	2	·021
50 ... 54	75	·798	9	·096	16	·170	4	·042
55 ... 59	46	·765	13	·216	17	·283	3	·050
60 ... 64	51	·781	18	·278	16	·247	5	·077
65 ... 69	44	1·059	17	·409	24	·577	8	·193
70 ... 74	44	1·259	17	·486	18	·515	12	·343
75 ... 79	25	1·296	4	·207	8	·415	7	·363
All Ages ...	869	·607	126	·088	170	·119	53	·037

Abstract L.—(*continued*).

Age.	CAUSES OF DEATH.									
	VIII. Diseases of the Organs of Generation.		IX. Diseases of the Organs of Locomotion.		X. Diseases of the Integumentary System.		XI. Old Age.		XII. External Causes, Poisoning, Asphyxia, Injuries.	
	Number of Deaths.	Mortality per Cent.	Number of Deaths.	Mortality per Cent.	Number of Deaths.	Mortality per Cent.	Number of Deaths.	Mortality per Cent.	Number of Deaths.	Mortality per Cent.
15 to 19	...	...	6	·026	1	·004	...	...	26	·112
20 ... 24	...	...	7	·033	3	·014	...	...	20	·093
25 ... 29	...	...	2	·012	...	...	...	...	15	·091
30 ... 34	...	...	1	·006	...	...	...	...	13	·082
35 ... 39	...	...	2	·016	2	·016	...	...	17	·135
40 ... 44	...	...	2	·016	...	...	...	...	15	·118
45 ... 49	...	...	3	·032	...	...	...	...	12	·128
50 ... 54	...	...	2	·021	...	...	...	...	7	·075
55 ... 59	...	...	1	·017	...	...	...	...	3	·050
60 ... 64	1	·015	2	·031	1	·015	20	·308	9	·139
65 ... 69	1	·024	...	...	2	·048	31	·312	5	·151
70 ... 74	2	·057	1	·029	1	·029	77	2·204	3	·086
75 ... 79	1	·052	1	·052	1	·052	106	5·495	3	·156
All Ages...	5	·003	30	·021	11	·008	234	·163	148	·010

Abstract M.

Twenty-four Town Districts of England.—Males.

Age.	Male Population.	All Causes.		Zymotic, Endemic, and Contagious Diseases.		Diseases of Uncertain or Variable seat.		Diseases of the Nervous System.	
		Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.
15 to 20	83,707	758	·906	138	·165	61	·073	40	·048
20 ... 30	161,585	1,756	1·087	270	·167	112	·069	71	·044
30 ... 40	123,104	1,804	1·465	225	·183	159	·129	132	·107
40 ... 50	83,442	1,786	2·140	216	·259	202	·242	148	·177
50 ... 60	47,648	1,526	3·203	121	·254	213	·447	162	·340
60 ... 70	27,577	1,598	5·795	100	·363	221	·801	189	·685
70 ... 80	10,555	1,291	12·231	50	·474	123	1·165	110	1·042
	537,618	10,519	1·957	1,120	·208	1,091	·203	852	·158

Age.	Male Population.	Diseases of the Respiratory Organs.		Diseases of the Organs of Circulation.		Diseases of the Digestive Organs.		Diseases of the Urinary Organs.	
		Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.
15 to 20	83,707	322	·385	24	·029	37	·044	1	·001
20 ... 30	161,585	957	·592	39	·024	63	·039	11	·068
30 ... 40	123,104	897	·729	49	·040	103	·084	16	·013
40 ... 50	83,442	825	·989	60	·072	119	·143	22	·026
50 ... 60	47,648	654	1·373	61	·128	121	·254	19	·010
60 ... 70	27,577	545	1·976	63	·228	105	·381	29	·105
70 ... 80	10,555	225	2·132	20	·189	48	·455	31	·294
	537,618	4,425	·823	316	·059	596	·111	129	·024

ABSTRACT M.—(*continued.*)

Age.	Male Population.	Diseases of the Organs of Generation.		Diseases of the Organs of Locomotion.		Diseases of the Integumentary System.		Old Age.		External Causes, Poisoning, Asphyxia, Injuries.	
		Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.	Deaths.	Mortality per Cent.
15 ... 20	83,707	...	...	14	·017	2	·002	...	...	111	·133
20 ... 30	161,585	1	·001	20	·012	...	...	...	...	195	·121
30 ... 40	123,104	2	·002	25	·020	8	·006	...	...	180	·146
40 ... 50	83,442	...	...	13	·016	9	·011	...	...	153	·183
50 ... 60	47,648	...	...	25	·052	6	·013	27	·057	97	·204
60 ... 70	27,577	1	·004	18	·065	10	·036	230	·834	61	·221
70 ... 80	10,555	...	...	6	·057	3	·028	642	5·944	24	·227
	537,618	4	·001	121	·023	38	·007	899	·017	821	·015

ABSTRACT N.

Mortality of the Metropolis.—Males.

Causes of Death.	Ages.							
	15—19.	20—29.	30—39.	40—49.	50—59.	60—69.	70—79.	All.
	Mortality per Cent.							
All Causes	·161	·900	1·301	1·967	3·105	4·850	7·448	2·004
I. Zymotic Diseases	·023	·095	·089	·119	·171	·177	·380	·131
Sporadic Diseases.								
II. Of uncertain, or variable seat	·015	·067	·163	·270	·537	·818	1·258	·293
III. Of the Nervous System	·008	·045	·120	·237	·039	·600	·892	·215
IV. Of the Respiratory Organs	·072	·543	·689	·962	1·357	1·589	1·268	·809
V. Of the Organs of Circulation	·004	·031	·062	·085	·138	·253	·195	·082
VI. Of the Digestive Organs	·011	·032	·059	·118	·234	·319	·224	·112
VII. Of the Urinary Organs	·001	·006	·017	·039	·088	·170	·181	·045
VIII. Of the Organs of Generation	...	...	...	...	...	...	·104	0·002
IX. Of the Organs of Locomotion	·003	·010	·018	·014	·019	·038	·024	·017
X. Of the Integumentary System	...	·001	·001	·004	·005	·020	·020	·004
XI. Old Age	...	...	...	...	·023	·704	2·847	·191
XII. External causes—Poisoning, Asphyxia, Injuries	·025	·066	·083	·119	·145	·131	·156	·104

With respect to the results furnished in the preceding Abstracts, it may be sufficient to refer to those in connection with the term of life 41–50; and so far as concerns the group of zymotic diseases, it is obvious that the intensity of mortality is higher in the Gotha Life Office than in any of the other classes of facts brought forward; but in regard to group II, which includes dropsy, cancer, and diseases of uncertain seat,

the opposite result is observable, the mortality being less in the Gotha Life Office than in any of the other classes of facts now under observation; but in respect to the diseases of the respiratory organs, the results for the same ages are very remarkable and important, being for the four different classes of facts, as follows, viz.:—

Gotha Life Office	·419 per cent.
Division of East Kent	·520 ...
Metropolis	·962 ...
Twenty-four Towns	·989 ...

The immunity from this class of diseases in the Gotha Life Office, and also in the division of East Kent, is remarkable, when placed in contrast with the other figures. Similar remarks are applicable to the two other classes of diseases contained in the following condensed abstract of figures presented in the preceding Abstracts:—

Group of Diseases, classified as in Table XIII.	Results per Cent.—Ages 41—50—for the different Classes of Disease in the			
	Gotha Life Office.	Division of East Kent.	Metropolis.	Twenty-Four Towns.
I	·279	·166	·119	·259
II . . .	·186	·190	·270	·242
III + VI .	·419	·520	·962	·989
IV . . .	·159	·299	·237	·177
VII . . .	·095	·109	·118	·143

The differences for other terms of life will be easily discovered from an examination of the various Abstracts.

With respect to the deaths which have taken place from Asiatic Cholera, it will be seen, from Abstract H, that 12 deaths took place from that cause in the ten years 1829–38, 17 in the ten years 1839–48, and 31 in the year 1849. In Table XI, it will be seen that, although the greatest number of deaths happened in the decennial term of life 41–50, still the highest rate of mortality from this disease was at ages 61–70; and if the results for the whole 21 years, as set forth in Table XIII, be considered in reference to age, it will be seen that the largest number of deaths have taken place between ages 51–60; but the rate of mortality has gone on increasing from the youngest to the oldest age, as will be seen by the following Abstract:—

Age.	Lives Exposed to Risk.	Deaths from Cholera.	Mortality per Cent.	Being One Death in
31 to 40	33,870	7	·021	4,762
41 ... 50	47,010	15	·032	3,125
51 ... 60	31,050	18	·058	1,724
61 ... 70	12,382	17	·137	730
71 ... 80	1,719	3	·175	571
Total.....	126,031	60	·048	2,083

A similar law has always been observed elsewhere, although during epidemic periods the mortality must of course be greater than that shewn in the above Table. A few deaths took place at intervals throughout the whole period; but if the principal year of the epidemic be considered, namely, 1849, the rate of mortality will appear much increased:—

Age.	Lives Exposed to Risk.	Deaths from Cholera.	Mortality per Cent.	Being One Death in
31 to 40	3,565	3	·084	1,188
41 ... 50	5,766	3	·052	1,922
51 ... 60	3,060	10	·327	306
61 ... 70	1,653	12	·726	138
71 ... 80	341	3	·880	114
Total.....	14,385	31	·215	464

This will be found to be much under the rate of mortality from cholera in Paris and many other places during the year 1832, for all ages taken collectively; the result being one in 42·7 for Paris, but one in 464 in the Gotha Life Office, for ages 31–80. The influence of age is very remarkable in modifying the mortality from this disease. The following are the results for all ages in Paris, shewing the mortality from cholera from the 26th March to the 30th September, in the year 1832:—

Age.	Population.	Deaths from Cholera.	Mortality per Cent.	Being One in
0 to 5	53,124	1,311	2·468	41
5 ... 10	50,059	392	783	153
10 ... 15	54,696	202	369	271
15 ... 20	79,058	377	477	210
20 ... 25	82,044	959	1·169	86
25 ... 30	75,836	1,206	1·590	63
30 ... 40	125,188	2,771	2·213	45
40 ... 50	97,526	3,727	2·796	36
50 ... 60	81,415	2,913	3·577	28
60 ... 70	58,625	3,121	5·324	19
70 ... 80	23,262	2,044	8·787	11
80 ... 90	4,715	365	7·741	13
90 ...100	314	14	4·458	22
Total.....	785,862	18,402	2·342	42·7

The following is the rate of mortality from cholera, at corresponding ages, in the Gotha Life Office, Paris, and London:

Age.	Gotha Life Office, 1849.		Paris, 1832.		London, 1849.	
	Per Cent.	One in	Per Cent.	One in	Per Cent.	One in
31 to 40	·084	1,186	2·213	45	·661	151
41 .. 50	·052	1,922	2·796	36	·830	120
51 .. 60	·327	306	3·577	28	1·243	80
61 .. 70	·726	138	5·324	19	1·726	58
71 .. 80	·880	114	8·787	11	2·182	46
Total ..	·215	464	3·776	26	·962	104

Hence the mortality within the ages 31–80, is one in 464, while in Paris it was one in 26, and in London one in 104. The differences for each of the decennial periods of life are also shewn.

Abstract H, and Tables XI and XIII, will shew the mortality from violent causes. In the ten years, 1829–38, 11 deaths took place from suicide; in the twenty years, 1829–48, 64 deaths from the same cause; 39 of these deaths took place between ages 41–60. During the twenty-one years, 1829–49, 87 deaths took place from violent causes of all kinds, and an inspection of Section XVII of Table XIV, will shew the influence of age on the rate of mortality from these causes, and it will be found that with but slight irregularities, which appear to be due chiefly to small numbers, there is a gradual rate of increase from the younger to the older ages. In England and Wales, the deaths from violence, within the above ages, are one in 19; in the Equitable Life Office, one in 54; and in the Scottish Widows' Fund, one in 35; and in the Gotha Life Office, one in 28 of the total deaths, within the same term of life. This question will hereafter be more fully discussed.

Allusion has just been made to the mortality in the Scottish Widows' Fund and Life Assurance Society. In the "Monthly Journal of Medical Science" for January 1847, will be found a most interesting paper by James Begbie, M.D., Consulting Physician to the Society, on the Mortality of the Members. This is the only published document* of any importance which gives the mortality from different causes amongst assured lives: the nosological arrangement of the return by the Equitable Society being so defective as to render the results of little or no practical value.

The facts brought under consideration by Dr. Begbie include the experience of the "Scottish Widows' Fund" for the years 1815–45, in which 642 deaths took place among 5989 persons, of whom 447 were females; but it is important to observe that all those persons whose policies were either surrendered or forfeited are not included in the preceding numbers, so that the full number of persons exposed to the risk of mortality in the

* See also Table XX and Abstract S, which give the results of a further contribution by Dr. Begbie. Table XX likewise furnishes the general results of a similar investigation by Professor Christison.

Society, during the thirty-one years above referred to, is not given. There is another element of importance wanting in Dr. Begbie's paper. While the ages at death from different causes are furnished, the population for those ages, or the number of persons exposed to the risk of mortality at the corresponding terms of life is not given. It is greatly to be regretted that such is the case, for it deprives his paper of one of its most important uses. However, this defect might to some extent have been supplied from the distribution of ages in the Gotha Life Office, which cannot differ in any very marked manner from those in the Scottish Widows' Fund, had the gross numbers exposed to the risk of mortality also been given, and the surrendered and forfeited policies not been excluded. Notwithstanding these deficiencies, which will render a strict comparison with the results of the Gotha Life Office impossible, Dr. Begbie's paper is still full of interest, and should be studied by every one connected with the management of Life Offices, or giving attention to the more general question of Vital Statistics. It will be impossible within the limits assigned to the present contribution to do justice to the discussion into which Dr. Begbie enters on the results of his investigation: those who desire to follow him in those important details, must have recourse to the paper itself. The following exhibits the deaths from different causes, for all ages collectively, in the Gotha Life Office, and in the Scottish Widows' Fund Life Assurance Society.

ABSTRACT O.

CAUSE OF DEATH.	Gotha Life Office.		Scottish Widows' Fund.	
	Number of Deaths.	Per Centage to Total Deaths.	Number of Deaths.	Per Centage to Total Deaths.
Epidemic and Contagious Diseases	503	20·356	93	14·486
Diseases of uncertain seat	380	15·378	52	8·100
Diseases of the Brain and Nerves	375	15·176	133	20·720
Diseases of the Respiratory Organs	688	27·843	152	23·676
Diseases of the Heart and Blood-Vessels	69	2·792	53	8 255
Diseases of the Organs of Digestion	207	8·377	77	11·994
Diseases of the Urinary Organs	40	1·619	23	3·582
Childbirth and Diseases of the Uterus, &c.	10	·405	5	·779
Diseases of the Joints	18	·729	3	·467
Violent Deaths	87	3·521	18	2·803
Old Age	86	3·480	6	·934
Causes not specified	8	·324	27	4·204
Total Deaths	2,471	100·000	642	100·000

In the above Abstract the relation of the two classes of facts is obvious, and calls for no further commentary; but it may be useful to give the results for each class of disease in the Scottish Widows' Fund according to age.

ABSTRACT P.

DISEASE.	Ages at Death.							
	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Above 80.	Total.
Epidemic and Contagious Diseases . . .	5.	15	28	18	22	4	1	93
Diseases of uncertain seat	2	4	7	15	14	9	1	52
Diseases of the Brain and Nerves . . .	5	14	36	34	29	14	1	133
Diseases of the Respiratory Organs . . .	12	45	32	28	22	11	2	152
Diseases of the Heart and Blood-Vessels .	...	9	11	15	13	3	2	53
Diseases of the Organs of Digestion . .	3	13	17	21	17	6	...	77
Diseases of the Urinary Organs	...	2	2	6	4	8	1	23
Childbirth and Diseases of the Uterus, &c.	...	2	3	...	...	...	...	5
Diseases of the Joints	...	1	...	1	1	...	...	3
Violent Deaths	1	4	7	5	1	...	...	18
Old Age	...	...	...	...	...	2	4	6
Causes not specified or ascertained . . .	...	...	...	...	...	...	...	27
All Diseases	28	109	143	143	123	57	12	642

In order that many of the preceding results may be clearly understood, it is necessary to direct attention to Tables XV and XVI, the former of which shews the progress of the Gotha Society, from 1829 to the end of the year 1849, and the latter shews the number and amount of assurances subsisting at the end of the year 1848.

TABLE XV.

Number of Persons effecting Assurances during the Years 1829—49.

Year.	Number of persons making new Proposals.	Number of persons effecting new Policies.	Gross number of persons Assured throughout the Year.	Persons on whose lives Policies were discontinued.			Persons on whose lives Policies were in force at the end of the Year.	Increase in the Year.	Average Age of the Assured.	
				Lapses.	Deaths.	Total.			Years.	Months.
1829	1,581	1,285	1,285	...	12	12	1,273	1,273	42	7
1830	607	504	1,777	14	16	30	1,747	474	42	9
1831	1,491	1,244	2,991	46	27	73	2,918	1,171	41	10
1832	1,574	1,165	4,083	214	53	267	3,816	898	42	$4\frac{1}{2}$
1833	1,351	1,041	4,857	120	46	166	4,691	875	42	9
1834	1,218	902	5,593	156	65	221	5,372	681	43	1
1835	1,318	989	6,361	156	85	241	6,120	748	43	$3\frac{1}{2}$
1836	1,635	1,213	7,333	172	108	280	7,053	933	43	5
1837	1,581	1,151	8,204	174	123	297	7,907	854	43	8
1838	1,555	1,154	9,061	158	124	282	8,779	872	44	0
1839	1,419	1,024	9,802	199	123	322	9,481	702	44	$4\frac{1}{2}$
1840	1,485	1,089	10,570	200	136	336	10,234	753	44	$8\frac{3}{4}$
1841	1,414	983	11,217	184	158	342	10,875	641	45	1
1842	1,352	1,013	11,888	174	191	365	11,523	648	45	5
1843	1,503	1,049	12,572	195	201	396	12,176	653	45	10
1844	1,493	1,073	13,249	186	197	383	12,866	690	46	0
1845	1,412	1,018	13,884	181	235	416	13,468	602	46	4
1846	1,484	1,096	14,564	214	224	438	14,126	658	46	7
1847	1,706	1,235	15,361	244	289	533	14,828	702	46	10
1848	1,151	824	15,652	291	325	616	15,036	208	47	4
1849	1,377	1,011	16,047	239	337	576	15,471	435	47	9
Total.	29,707	22,063	196,352	3,517	3,075	6,592		15,471		

The above will not correspond exactly in some of its details, particularly in relation to the number of deaths, with some of the preceding figures; in fact Table XV is a financial statement of the Society, and those conversant with the practical working of such institutions, will immediately understand the cause of such differences. The number of deaths which have actually taken place up to any given date being of necessity, in every large Society, greater than the payments made on account of deaths to the same date.

In the following Table will be found a statement of the number of assurances in the Gotha Life Office, subsisting on the 31st of December, 1848; to many persons the results may be interesting. The amounts assured are expressed in thalers, or rixdollars Prussian current, each being worth nearly three shillings sterling.

Table XVI.

Assurances subsisting in 1848.

Age.		200— 1,000 Thlr.	1,100— 2,000 ...	2,100— 3,000 ...	3,100— 4,000 ...	4,100— 5,000 ...	5,100— 6,000 ...	6,100— 7,000 ...	7,100— 8,000 ...	8,100— 9,000 ...	9,100—10,000 ...	Total.
15 to 20	Persons.	4	...	...	...	...	...	...	...	...	...	4 Persons 3,500 Thlr.
21 ... 25		77	7	1	...	2	...	...	...	...	...	87 ... 67,800 ...
26 ... 30		391	73	20	8	10	3	3	3	2	9	522 ... 692,200 ...
31 ... 35		882	241	71	36	34	20	3	7	2	12	1,308 ... 1,888,900 ...
36 ... 40		1,412	387	127	64	55	23	4	14	1	22	2,109 ... 3,077,600 ...
41 ... 45		1,759	585	178	109	69	45	5	19	2	27	2,798 ... 4,307,100 ...
46 ... 50		1,628	618	199	146	70	37	13	35	1	29	2,776 ... 4,614,000 ...
51 ... 55		1,246	478	174	94	64	41	8	19	2	21	2,147 ... 3,562,000 ...
56 ... 60		843	334	118	98	69	43	7	15	3	15	1,545 ... 2,813,400 ...
61 ... 65		549	217	83	60	29	21	10	15	...	6	990 ... 1,750,500 ...
66 ... 70		279	111	32	20	19	14	4	8	1	1	489 ... 842,200 ...
71 ... 75		133	37	16	15	5	3	...	2	...	1	212 ... 327,700 ...
76 ... 84		30	15	...	1	1	1	1	...	...	...	49 ... 64,300 ...
	Total.	9,233 Persons 6,611,100 Thlr.	3,103 ... 5,337,900 ...	1,019 ... 2,880,100 ...	651 ... 2,534,200 ...	427 ... 2,112,600 ...	251 ... 1,499,100 ...	58 ... 396,200 ...	187 ... 1,089,000 ...	14 ... 121,500 ...	143 ... 1,429,500 ...	15,036 Persons 24,011,200 Thlr.

In the preceding Table there is one feature of an unusual character, and of much practical importance to Life Offices, the ratio of lapsed policies to the gross number of policies effected. It will be seen that out of 22,063 persons whose lives were assured, the policies on the lives of 3517 were either surrendered, forfeited, or had expired; being about 16 per cent. of the whole. To those not familiar with the experience of Life Offices in this respect, the proportion may seem high: but it is very much below that of Life Offices in this country, and merits serious consideration on the part of those transacting assurance business on the Continent.

The following Abstract will shew the results for the Gotha Life Office, the Equitable Society of London, and the fifteen Life Offices reported on in 1843 by the Committee of Actuaries.

ABSTRACT Q.

Source of Data.	Date of Experience.	Entrants.	Existing at the termination of Experience.		Discontinued.		Died.	
			Number.	Per Centage to Entrants.	Number.	Per Centage to Entrants.	Number.	Per Centage to Entrants.
Equitable Life Office.	1762-1829, being 68 years	21,398	6,930	32·4	9,324	43·6	5,144	24·0
Fifteen Life Offices. .	1772-1838, but chiefly from 1810-38, being 29 years	40,616	25,462	62·7	11,226	27·6	3,928	9·7
Gotha Life Office. . .	1829-49, being 21 years ...	22,063	15,471	70·1	3,517	16·0	3,075	13·9
Combined Results...	.....	84,077	47,863	56·9	24,067	28·7	12,147	14·4

It is hence obvious that while the number of discontinued policies, being policies which have ceased to exist from all causes except death, is only about 16 per cent. of the original number of entrants in the Gotha Life Office, the ratio is as high as 43·6 per cent. in the Equitable, and even 27·6 per cent. in the fifteen Life Offices. It is to be regretted that the causes of discontinuance of the policies in each of those groups are unknown, but there is such a disparity in the results, that there can be very little doubt that a greater proportion of the policies issued on the Continent are kept in force for prudential reasons or family provisions, and that whether the increased ratio of discontinued policies in this country results from a greater proportion being originally effected for a temporary period only, still it is evident, from the fact of a less proportion of them being kept in force, that the prudential feelings among the assuring classes in Germany must be stronger than in this country.

The figures in the last column of Abstract Q, when viewed by themselves, can convey but little information, as the results are not derived from the number exposed to the risk of mortality, but from the original number of entrants, and consequently the rate of

mortality will depend on the ratio of discontinued policies, and the ages of the persons exposed to the risk of mortality.

In the following Abstract will be found the mortality per cent., without distinction of age, and the average duration of the assurances in each group of facts.

ABSTRACT R.

Data.	Exposed to Risk.	Deaths.	Mortality per Cent.	Entrants.	Average Duration of each Policy.
Equitable	266,872	5,144	1·9	21,398	12·5 years
Fifteen Offices . . .	220,787	3,928	1·8	40,616	5·4 ...
Gotha Life Office . .	179,884	3,075	1·7	22,063	8·1 ...
Total . .	667,543	12,147	1·8	84,077	7·9 ...

The greater age of the Equitable Life Office destroys the value of any comparison between the results derived from the experience of that Society and either of the other sources of data; but a comparison may fairly be made between the results for the fifteen Life Offices and the Gotha Life Office. Fourteen of these Offices had on an average been established for eighteen years before the close of the experience here brought under review, and if the eldest office of the fifteen be included, the average duration of the term over which their transactions extend will not differ widely from that of the Gotha Life Office. This much being explained, it is certainly a very remarkable fact that the average duration of each policy effected in the English Life Offices should be less than five and a half years, and, in the Gotha Life Office, more than eight years. It is stated in the report by the Committee of Actuaries that, taking the whole of the data which they had under investigation, and which includes the above fifteen offices, and also the Equitable and Amicable Life Offices, the two oldest in existence, the average duration of all the policies is under eight years and a half. It is therefore evident that the interests of a Life Office, and particularly so in this country, are influenced by a great many other causes than simply the law of mortality prevailing among its members; and there is reason to believe that those disturbing causes will increase in intensity with the increased age and experience of the offices, and the gradual extension of the practice of Life Assurance among the population of this country.

In further illustration of this view the following analysis of the data furnished by the Committee of Actuaries, already referred to, will be of interest and importance to those connected with the management of life institutions. In order to construct Table XVII, it was necessary to make a very detailed analysis, shewing for policies effected at each quinquennium of age, the number of premiums received on each class of policies distinguished in the second, third, and fourth columns of the following Table.

The aggregate results so far as the policies in columns 3 and 4 are concerned is shewn in column 5. It is also necessary to explain that the amount assured by each policy was for the purpose of this illustration assumed to be £100, and that the scale of premiums payable under the policies was such as would be deduced from Table C, males, pp. 5–6 *ante*, calculated at 3 per cent. with a loading of 20 per cent.—a rate of premium which would be a fair average rate according to the present practice of life offices.

Table XVII

Shewing the number of "Existing" and "Discontinued" Policies, the number of deaths which have taken place, and the ratio of the premiums which have been received on "Discontinued" Policies and Policies which have become "claims," to the sums paid on account of all the deaths which have happened.

Age when Assured.	Number of Policies.				Amount of Premiums received on (c) = (d)	Sums paid for Deaths = (e)	Ratio of (d) to (e)	Age when Assured.
	Existing.	Discontinued = (a)	Deaths = (b)	Number of Premiums received on (a) + (b) = (c)				
					£	£		
1 to 5	10	2		7	10·50			1 to 5
6 ... 10	109	48	3	259	388·50	300	129·500	6 ... 10
11 ... 15	207	115	13	622	977·17	1300	75·167	11 ... 15
16 ... 20	401	332	38	1438	2571·17	3800	67·662	16 ... 20
21 ... 25	1468	1130	106	4755	9547·95	10600	90·075	21 ... 25
26 ... 30	3459	1643	288	8764	19788·82	28800	68·711	26 ... 30
31 ... 35	4494	1870	458	11197	28697·89	45800	62·659	31 ... 35
36 ... 40	4432	1819	500	11061	32674·58	50000	65·349	36 ... 40
41 ... 45	3787	1454	495	9720	33611·66	49500	67·902	41 ... 45
46 ... 50	2811	1162	542	8834	36440·14	54200	67·233	46 ... 50
51 ... 55	1977	821	528	6918	34617·84	52800	65·564	51 ... 55
56 ... 60	1318	473	453	4998	30947·82	45300	68·317	56 ... 60
61 ... 65	719	229	329	3177	24847·35	32900	75·524	61 ... 65
66 ... 70	223	98	135	1102	11093·79	13500	82·176	66 ... 70
71 ... 75	41	24	36	306	4048·37	3600	112·455	71 ... 75
76 ... 80	6	6	4	45	795·96	400	198·999	76 ... 80
Total.....	25462	11226	3928	73203	271059 51	392800	69·012	Total.

The ratios shewn in the 8th column of this Table will differ in some measure from the actual facts of the case, in consequence of fluctuations which may have taken place in the average of the amounts assured by "discontinued" policies, and by policies on which "claims" have arisen; and likewise in the disparity between the number of "short term" policies in the respective columns and those for the "whole of life"; but these objections will not in any serious way injure the practical value of the illustration furnished in the preceding Table.

It will be observed that between ages 26–60, the uniformity of the ratios in column 8, or the ratios of premiums received on the policies represented in columns 3 and 4, that is on discontinued policies of all sorts, to the amounts paid for claims, is very

remarkable: at the younger and older ages the numbers are small, and the results of course fluctuate. It thus appears that the premiums received on "discontinued" policies from all causes, death or otherwise, have, without any allowance being made for accumulation at interest, sufficed to meet 69·012 per cent. of the payments required on account of the deaths which have taken place. This is certainly a very striking fact when viewed in connection with the practice of life assurance, and will on reflection, after making full allowance for purchased or surrendered policies, be found to account to a very large extent for the enormous profits realised by some of the institutions from whose progress the preceding results are derived. It is not to be considered that the more recent experience of life offices is less remarkable: for as the practice of life assurance has gradually extended itself, the number of policies effected for purely prudential and family purposes is yearly becoming less and less in relation to the whole number effected; in consequence of the immense increase of assurances made on account of pecuniary arrangements of a temporary character. The future experience of Life Offices is, therefore, likely to exhibit results still more striking than those furnished in Table XVII.

It is obvious that in the process of constructing the preceding Tables, elements must have appeared by which it was easy to determine, from the experience of the fifteen offices now under consideration, the same class of facts as are exhibited for the Gotha Office in Abstract C, page 160 *ante*. The results of this part of the investigation will be found in the next Table.

Table XVIII.

Period elapsed from the date of Assuring at various Ages till Death, of those dying among the Assured in the Fifteen Offices reported on by the Committee of Actuaries in 1843.

Age when Assured.	Number of Premiums received on each Policy.	Duration of Life.	Duration of Life to each Person.	Duration of Life.	Duration of Life to each Person.
		Years.	Years.	Years.	Years.
6 to 10	3	18	6·000		
11 ... 15	13	55	4·231	253	4·685
16 ... 20	38	180	4·737		
21 ... 25	106	553	5·217		
26 ... 30	288	1712	5·944	2265	5·749
31 ... 35	458	2799	6·111		
36 ... 40	500	3241	6·482	6040	6·305
41 ... 45	495	3306	6·679		
46 ... 50	542	3680	6·789	6986	6·736
51 ... 55	528	3394	6·428		
56 ... 60	453	3004	6·631	6398	6·522
61 ... 65	329	2210	6·717		
66 ... 70	135	803	5·207	3013	6·494
71 ... 75	36	208	5·778		
76 ... 80	4	26	6·5		
Total...	3928	25189	6·413		

The results of this Table, although not shewing differences between the policies on young and old lives so marked as those in Abstract C, are still very remarkable; and strikingly corroborative of the operation of the principles which have been found to prevail in the Gotha Life Office. It will be seen that while in regard to the deaths which have taken place amongst persons assured at ages 21-30, the period which elapsed from the date of effecting the policy was 5·749 years, that which elapsed amongst those assuring in the decennium 41–50 was 6·736 years, the corresponding figures for the Gotha Office being 6·500 years and 9·750 years. After the observations which have been already made in pages 159–165, and also in pages 179–181, it is unnecessary to enlarge here on this part of the inquiry.

Before concluding the present contribution, it is necessary to state that, since I made the preceding investigation into the experience of the Gotha Life Office, Mr. Hopf, the Actuary of the Company, has published an able paper shewing the general results of the operations of the Society for the twenty-five years 1829–54, but not attempting to discuss the many curious and novel features which have arisen in this inquiry from the analysis of the data supplied by the annual reports of the Gotha Company. That the effect of the additional five years' experience on the preceding results may, however, be seen, the following Table is given, prepared on the model of Table XI, page 170 *ante*, from the facts furnished in Mr. Hopf's paper.

TABLE XIX.

Disease.	Ratio of Deaths from Different Causes during 1829 to 1854, at the following Ages.													
	15—30.		31—40.		41—50.		51—60.		61—70.		71—87.		All Ages.	
	Number of Lives at Risk during 1829—1854.													
	11,193		65,378		89,705		59,592		22,562		3,459		251,889	
	No. of Deaths.	Mortality per Cent.	No. of Deaths.	Mortality per Cent.	No. of Deaths.	Mortality per Cent.	No. of Deaths.	Mortality per Cent.	No. of Deaths.	Mortality per Cent.	No. of Deaths.	Mortality per Cent.	No. of Deaths.	Mortality per Cent.
Fever	22	·197	133	·203	197	·220	206	·346	123	·545	36	1·041	717	·285
Influenza	..	..	12	·018	12	·013	12	·020	20	·088	7	·202	63	·025
Asiatic Cholera	..	..	18	·027	28	·031	36	·060	30	·133	8	·231	120	·048
Exanthematic Diseases	2	·018	5	·008	2	·002	1	·002	1	·004	..	..	11	·004
Local Inflammation	13	·116	95	·145	147	·164	157	·263	113	·501	29	·838	554	·211
Gout and Rheumatism	4	·036	20	·032	32	·036	32	·054	34	·157	5	·145	127	·054
Chronic Diseases of the Respiratory Organs	23	·206	163	·249	239	·266	181	·304	84	·372	8	·231	698	·277
Chronic Abdominal Diseases	1	·009	57	·872	120	·134	161	·270	152	·674	27	·781	518	·205
Organic Diseases of the Brain	..	..	15	·024	27	·030	33	·055	21	·093	5	·145	101	·040
Organic Diseases of the Spinal Marrow	..	..	7	·011	12	·013	9	·015	15	·066	2	·057	45	·018
Organic Diseases of the Heart	2	018	8	·012	27	·030	39	·065	38	·168	5	·145	119	·047
Dropsy	3	·027	24	·036	82	·091	140	·235	122	·541	35	1·012	406	·161
Cancers and Malignant Ulcers	..	..	3	·004	30	·033	27	·045	21	·093	11	·318	92	·036
Apoplexy	7	·063	34	·052	107	·119	233	·391	184	·816	58	1·677	623	·247
Old Age	..	..	..	..	..	..	..	..	54	·239	115	3·325	169	·067
Accidents	..	..	9	·014	18	·020	16	·027	11	·049	..	..	54	·021
Murdered	..	..	1	·001	1	·001	1	·002	..	..	..	..	3	·001
Suicide	4	·036	18	·027	29	·032	34	·056	14	·062	1	·029	100	·040
Capital Punishment	..	..	..	..	1	·001	..	..	..	..	..	..	1	·000
Total	81	·724	622	·951	1,111	1 239	1,318	2·212	1,037	4·596	352	10·176	4,521	1·794

The preceding results will not be found in any way to disturb the conclusions arrived at in the former part of this contribution; the rate of mortality, from the prolonged average duration of the policies and the consequent gradual disappearance of the effects of the original selection of the lives, being increased but to a very slight extent. The characteristic results of each class of disease is markedly similar to those already exhibited.

Since this investigation was originally made, Dr. Begbie has published another paper on the mortality which has taken place in the "Scottish Widows' Fund." It will be found in the "Monthly Journal of Medical Science" for August 1853, and includes the experience of the Society from its formation in 1815 to the close of the year 1852. In the same number of that publication will likewise be found a paper by Professor Christison, of Edinburgh, on the deaths which took place within the five years 1846–50 in the "Standard Assurance Company," of which he is the Medical Officer. Both papers are full of important and valuable information; and, as I have already remarked of Dr. Begbie's first paper, every one wishing to understand fully the contents of those now under consideration, must have recourse to the papers themselves; as it is here impossible to give more than such portions of the general results as bear directly on the questions already discussed in this contribution.

The following Table gives a succinct view of the three different classes of results:—

TABLE XX.

Cause of Death.	Gotha Life Office. 1839—49.		Scottish Widow's Fund. 1815–52.		Standard Life Office. 1846—50.	
	No. of Deaths.	Per Centage to Total Deaths.	No. of Deaths.	Per Centage to Total Deaths.	No. of Deaths.	Per Centage to Total Deaths.
I. Epidemic and Contagious Diseases . . .	503	20·356	223	16·742	69	23·549
II. Diseases of uncertain seat	380	15·378	94	7·057	15	5·119
III. Diseases of the Brain and Nerves . . .	375	15·176	283	21·246	53	18 089
IV. Diseases of the Respiratory Organs . . .	688	27·843	281	21·096	67	22·867
V. Diseases of the Heart and Blood Vessels .	69	2·792	119	8·934	24	8·191
VI. Diseases of the Organs of Digestion. . .	207	8·377	171	12·838	35	11·945
VII. Diseases of the Urinary Organs	40	1·619	53	3·979	6	2·048
VIII. Childbirth, and Diseases of the Uterus, &c.	10	·405	10	·751	2	·683
IX. Diseases of the Joints	18	·729	7	·526	...	...
X. Violent Deaths	87	3·521	36	2·702	9	3·072
XI. Old Age, and gradual decay	86	3·480	27	2·027	12	4·096
XII. Causes not specified	8	·324	28	2·102	1	·341
Total Deaths	2,471	100·000	1,332	100·000	293	100·000

From the limited extent of the facts connected with the "Standard Life Office," extending over a period of five years only, and not including the whole experience of the

Company since its establishment in the year 1825, the results cannot be expected to assimilate closely to the other two classes of facts, but it will, nevertheless, be found that in some respects there is a remarkable agreement between them.

It is very interesting to observe, that between the results given for the Scottish Widows' Fund in Abstract O, based on 642 deaths only, there is an extraordinary agreement with those in the preceding Table, deduced from 1332 deaths in the same Society. It will also be observed, that the extended experience of this Society as now submitted shews almost the same relation to that of the Gotha Life Office as was formerly remarked; the deaths from diseases of the brain and the nervous system, from diseases of the heart and blood-vessels, from diseases of the organs of digestion, from diseases of the urinary organs, and from childbirth and diseases of the uterus, being in excess in the former, and the remaining classes of disease being in excess in the latter society; the relation being precisely that which was exhibited in Abstract O. This is a circumstance of some importance, and is well calculated to bestow confidence in the results of Dr. Begbie's inquiry.

It is, however, very deeply to be regretted that neither Dr. Begbie nor Professor Christison has been enabled to furnish the number of lives exposed to the risk of mortality at the corresponding ages at which the deaths are recorded to have taken place. This serious defect in the data of their papers deprives their investigations of much of their value, and every student of Vital Statistics must lament the absence of elements so essential to every exact inquiry. An inspection of the results presented in Tables XI, XII, XIII, XIV, and XIX, and in Abstracts H, K, L, M, and N, of this contribution, will confirm the more casual reader in this conclusion. In the absence of all information as to the number of lives exposed to the risk of mortality at different ages, the following Abstract is given that a comparison may be instituted between it and Abstract P, page 191.

Abstract S.

Disease.	Ages at Death.							
	20 to 30.	30—40.	40—50.	50—60.	60—70.	70—80.	Above 80	Total.
I. Epidemic and Contagious Diseases . .	11	37	58	59	43	12	3	223
II. Diseases of uncertain seat	4	9	16	23	27	14	1	94
III. Diseases of the Brain and Nerves . .	8	30	70	63	73	32	7	283
IV. Diseases of the Respiratory Organs . .	19	65	60	57	44	26	10	281
V. Diseases of the Heart and Blood Vessels	1	12	24	38	34	8	2	119
VI. Diseases of the Organs of Digestion .	8	20	35	54	35	19	...	171
VII. Diseases of the Urinary Organs . . .	...	4	5	16	11	15	2	53
VIII. Childbirth and Diseases of the Uterus, &c.	...	3	6	...	1	...	...	10
IX. Diseases of the Joints	...	2	1	1	3	...	...	7
X. Violent Deaths	1	10	12	10	2	1	...	36
XI. Old Age	...	...	...	...	...	12	15	27
XII. Causes not specified or ascertained . .	...	...	...	...	...	...		28
Total . . .	52	192	287	321	273	139	40	1332

It will be seen by a comparison of the above results with those in Abstract P, that for ages under 50 there is considerable agreement; but at the higher ages there is some disturbance, which it is probable is more apparent than real, and may arise from the increased mortality due to an increased average age amongst the assured, in relation to their age at the date of admission into the Society: but, as already explained, in the absence of the element of the number of lives exposed to the risk of mortality at different ages and for the respective periods to which the facts in Abstracts P and S relate, it is impossible to give any positive opinion on this point. It is, however, to be hoped that in any similar inquiry which may be hereafter made, no such oversight will be found to have occurred.

The many varied and curious as well as highly-important practical results disclosed in the course of the analysis pursued in this contribution, will no doubt cause other inquirers to follow up the investigation of this subject into a more ample and complete development than has been possible on the present occasion.

ON THE RATE OF MORTALITY AMONG PERSONS OF INTEMPERATE HABITS.

In the next place it is proposed to investigate the rate of mortality which prevails among persons addicted to the immoderate use of intoxicating drinks. Assurance companies have generally declined to assure such lives, from the supposed greater mortality to which they were believed to be subject; but no attempt has been previously made to test this opinion by properly authenticated facts; and it is therefore hoped that the data now brought under consideration may not be without interest. The results are calculated to throw considerable light on a question not only curious in itself, but evidently of much importance to Life Offices, as well as to the public generally.

The remarkable efforts which have been recently made to reform the drinking usages of society will be a sufficient apology for bringing under attention statistical evidences on a subject so deeply affecting the social, moral, and religious condition of the people.

It may be well to remark, that, in collecting the present data, the intention was to include in the observations only such persons as were decidedly addicted to drinking habits, and it was not intended to bring within observation mere occasional drinkers, or what is usually termed generous or "free livers." The reasons for this distinction will hereafter appear. It may also be stated, that the primary reason for collecting the facts was to apply the results to life assurance operations, and it was consequently important to include only well-marked cases of intemperance. Examination will shew that, for social and moral purposes, this would also have been the only satisfactory course to follow; but that the plan adopted for obtaining the present collection of facts may be the better understood, the following circular and schedule are given:—

Medical, Invalid, and General Life Office,
25, Pall Mall, London.

SIR,

I beg to inclose you forms for the collection of cases of the mortality of persons of intemperate habits. Many difficulties have been experienced in attempts to procure satisfactory data on the value of life among persons addicted to the excessive use of intoxicating drinks, and therefore the present method has been resorted to, in order to increase the information on the subject. May I solicit your assistance in filling up any portion of the inclosed schedules; and should your knowledge of cases be so extensive as to require more than the number sent, others will be forwarded on hearing from you to that effect. If you could also suggest any gentleman who would be useful in giving the information required, I would put myself in communication with him on the subject.

Hoping I may calculate on your co-operation, I beg to direct your attention to the subjoined hints on filling up the schedules.

I am, SIR, your most obedient Servant,
F. G. P. NEISON, Actuary.

N.B.—No case should be entered in the schedule unless the person alluded to was decidedly addicted to drinking habits during a considerable period of life.

The peculiar feature of the intemperance, whether the favourite beverage was fermented or distilled liquors, should be stated in the column "Remarks," and also whether the intemperance continued to the time of death.

If the correct age at death be known, it will be entered as such; if not, the age must be guessed or approximated to by whoever fills up the schedule, or by the *mean age* of that guessed at by two or three persons who may have known the individual in question.

The name in full, or at least the initials of the person in question, and also the place of death, should be entered in the columns set apart for that purpose. This will be necessary, in order to correct double entries which may be made by two different persons.

In the column of the "Cause of Death," insert the post mortem examination, if practicable, such as diseases of the heart, liver, lungs, kidneys, &c., &c., (*and perhaps terminating in dropsy, &c., &c.*)

Please to return the schedules as soon as you have entered all the cases which have come under your observation.

It is not expected that the schedules can be always filled from registers or notes kept for the purpose; but generally from a distinct recollection of the cases, and an approximation to the truth is therefore all that is calculated on being obtained.

INTEMPERANCE.—SCHEDULE.

Description.			Death.			Disease or Cause of Death.	Duration of Intemperance.	Remarks on the Peculiar Features of the Intemperate Habits; whether they existed up to the period of Death, and any other Observations necessary.
Name or other Distinction.	Sex.	Profession or Occupation.	Date of.	Place of.	Age at.			

It is obvious that it would be very difficult, if not impossible, to give such a definition of what constitutes intemperate habits as would be satisfactory to every one; almost every person would have a standard of his own by which to determine the fact of temperance or intemperance, and therefore in the preceding circular no attempt has been made to define the particular character of the habits on which information is sought; and all that has been urged on the attention of those filling up the schedules is to give only well-marked cases, and to include none but persons who were decidedly addicted to drinking habits. The consequence of following this course is, that the objections which might be urged against the adoption of any individual or peculiar test are avoided, for, by leaving it to each contributor of data to determine for himself what constitutes decidedly intemperate habits, the whole data taken collectively, from all the various contributors, will shew very precisely the result of those habits which the public, by common consent, admit to be intemperate; so that, however any individual reasoner on the results may argue, and whatever peculiar construction he may choose to put upon them, it will be impossible to avoid the conclusion, that the data really relate to what the public generally regard as persons of intemperate habits. If the testimony of those more advanced in life is to be fairly trusted on this subject, it must be admitted, that during the last quarter of a century, the drinking practices of society have much altered, and what is now commonly regarded

as free living, would have been looked upon some years since as only moderation; so, in like manner, may it be hoped that the usages of society will continue to improve, and, at no distant date, the habits now considered not to exceed the bounds of moderation be altogether unknown in polite and refined society. It is, therefore, possible that what has hitherto been regarded as intemperate habits, may differ very widely from that which may be looked upon as intemperance some years hence.

From the information obtained on these schedules, the following facts and results are derived; and it may here be stated that defective schedules have been completely rejected. For the mode by which the data have been analysed, reference may be made to the paper "on the Mortality of the Medical Profession," pp. 103–4 *ante*, and to that on the "Mortality of Master Mariners," pp. 134–137 *ante*. A similar plan has been followed in the present instance, and a careful perusal of those papers will make the method clearly understood, and shew how the facts have been brought into the form of the following Table:—

Table I.

Mortality among Persons of Intemperate Habits.

Age.	Number coming under Observation at each Age.	Number remaining under Observation from Age preceding.	Total Number under Observation at each Age.	Died.	Half of Entered.	Number Exposed to Risk.	Age.	Number coming under Observation at each Age.	Number remaining under Observation from Age preceding.	Total Number under Observation at each Age.	Died.	Half of Entered.	Number Exposed to Risk.
14	1	..	1	..	·5	·5	53	..	105	105	5	..	105
15	3	1	4	..	1·5	2·5	54	1	100	101	3	·5	100·5
16	..	4	4	..	..	4	55	2	98	100	5	1	99
17	7	4	11	1	3·5	7·5	56	1	95	96	9	·5	95·5
18	5	10	15	..	2·5	12·5	57	..	87	87	1	..	87
19	4	15	19	..	2	17	58	..	86	86	6	..	86
20	29	19	48	..	14·5	33·5	59	..	80	80	2	..	80
21	7	48	55	1	3·5	51·5	60	1	78	79	17	·5	78·5
22	15	54	69	1	7·5	61·5	61	..	62	62	..	..	62
23	6	68	74	3	3	71	62	1	62	63	3	·5	62·5
24	14	71	85	4	7	78	63	..	60	60	..	..	60
25	19	81	100	7	9·5	90·5	64	..	60	60	4	..	60
26	11	93	104	5	5·5	98·5	65	..	56	56	9	..	56
27	14	99	113	7	7	106	66	..	47	47	4	..	47
28	20	106	126	3	10	116	67	..	43	43	2	..	43
29	9	123	132	2	4·5	127·5	68	..	41	41	6	..	41
30	35	130	165	14	17·5	148·5	69	..	35	35	1	..	35
31	9	151	160	4	4·5	155·5	70	..	34	34	11	..	34
32	18	156	174	8	9	165	71	..	23	23	2	..	23
33	18	166	184	4	9	175	72	..	21	21	2	..	21
34	13	180	193	5	6·5	186·5	73	..	19	19	5	..	19
35	15	188	203	11	7·5	195·5	74	..	14	14	4	..	14
36	13	192	205	10	6·5	198·5	75	..	10	10	5	..	10
37	5	195	200	5	2·5	197·5	76	..	5	5	..	..	5
38	8	195	203	15	4	199	77	..	5	5	..	..	5
39	4	188	192	3	2	190	78	..	5	5	1	..	5
40	19	189	208	21	9·5	198·5	79	..	4	4	..	..	4
41	5	187	192	2	2·5	189·5	80	..	4	4	1	..	4
42	1	190	191	16	·5	190·5	81	..	3	3	1	..	3
43	5	175	180	9	2·5	177·5	82	..	2	2	..	..	2
44	2	171	173	9	1	172	83	..	2	2	..	..	2
45	8	164	172	15	4	168	84	..	2	2	1	..	2
46	2	157	159	10	1	158	85	..	1	1	..	..	1
47	1	149	150	5	·5	149·5	86	..	1	1	..	..	1
48	5	145	150	7	2·5	147·5	87	..	1	1	..	..	1
49	..	143	143	3	..	143	88	..	1	1	..	..	1
50	..	140	140	22	..	140	89	..	1	1	..	..	1
51	1	118	119	3	·5	118·5	90	..	1	1	1	..	1
52	..	116	116	11	..	116	91	..	..	..	..	..	..

This Table will be better understood by an examination of the following condensed abstract of it.

ABSTRACT A.

Age.	Number Exposed to Risk.	Died.	Mortality per Cent.	Number Exposed to Risk.	Died.	Mortality per Cent.	England and Wales Mortality per Cent.	Proportion of Intemperance Mortality to that of England and Wales.	Number which ought to have died according to England and Wales.
16 to 20	74·5	1	1·342	74·5	1	1·342	·730	1·8	·5
21 ... 25	352·5	16	4·539	949·0	47	4·953	·974	5·1	9·2
26 ... 30	596·5	31	5·197						
31 ... 35	877·5	32	3·647	1861·0	86	4·620	1·110	4·2	20·7
36 ... 40	983·5	54	5·491						
41 ... 45	897·5	51	5·682	1635·5	98	5·992	1·452	4·1	23·7
46 ... 50	738·0	47	6·369						
51 ... 55	539·0	27	5·009	966·0	62	6·418	2·254	2·9	21·8
56 ... 60	427·0	35	8·197						
61 ... 65	300·5	16	5·324	500·5	40	7·992	4·259	1·9	21·3
66 ... 70	200·0	24	12·000						
71 ... 75	87·0	18	20·690	110·0	20	18·182	9·097	2·0	10·0
76 ... 80	23·0	2	8·696						
81 ... 85	10·0	2	20·000	15·0	3	20·000	19·904	1·0	3·0
86 ... 90	5·0	1	20·000						
Total	6111·5	357	5·841		357				110·2

These curious and remarkable results exhibit a rate of mortality for which the most careful observers will be generally unprepared. When intemperate lives are occasionally accepted by Life Offices, the rates of premium charged by them fall greatly short of what would be indicated by the preceding figures; and it is to be feared that a careful examination of their experience must shew that the arbitrary mode by which such peculiar risks have been estimated has led them into unprofitable speculations. Throughout the whole range of the Table, it will be seen that the rate of mortality is frightfully high, and unequalled by the results of any other series of observations made on any class of the

population of this country. Sanitary agitators have frequently excited alarm about the wholesale havoc in human life going on in the badly-conditioned districts of some of our large cities; but no collection of facts ever brought under attention has shewn so appalling a waste of life as is exhibited by the above results.

From the age of sixteen upwards, it will be seen that the rate of mortality exceeds that of the general population of England and Wales. In the 6111·5 years of life to which the observations extend, 357 deaths have taken place; but if these lives had been subject to the same rate of mortality as the population generally, the number of deaths would have been only 110, or not quite 31 per cent. At the term of life 21–30, the mortality is upwards of five times that of the general community; and in the succeeding twenty years of life, it is above four times as great, the difference, as might be expected, gradually becoming less and less as age advances. If there be anything, therefore, in the usages of society calculated to destroy life, the most powerful is certainly the inordinate use of strong drink.

From the preceding data the following Tables have been constructed, in order to exhibit more clearly the rate at which persons of intemperate habits die, and consequently the average duration of their lives.

The principles on which the methods of calculation, here employed, depend, are precisely the same as those which regulated the formation of the Tables in pp. 117–120, 129, and 145–148.

But that these principles may be more clearly understood, and the resulting processes defined, it may be useful to furnish some explanation of the method of interpolation employed in this and the preceding contributions, as some persons may be anxious to understand the precise steps of the argument which have led to the adoption of the principles here followed. They will be found fully demonstrated in an article in the "Connaissance des Temps pour l'an 1847;" by M. Fred. Maurice. Their first application to Mortality Tables will be found in my Report on the Bengal Military Fund, in 1849.

In this extract we must assume that the reader is acquainted with the method of finding the successive orders of differences, and also with the elementary expressions in the calculus of operations. We shall here adopt the usual notation of successive differences, though, for practical reasons, the exponents are placed at the bottom of the symbols where we have had occasion to use them in the former part of this work.

The proposition which we have to consider is as follows:—

Having a series of terms given, of which the differences of a certain order are constant, it is required to find any number of intermediate terms following the same law.

The difficulty lies in finding the differences of the interpolated series so as to suit

all cases,—whatever the number of terms to be interpolated may be, and whatever order of differences may happen to be constant in the given series.

We assume that in all cases in which the series consists of rational and integral functions, when equidistant terms have a certain order of differences constant, the intermediate numbers, if also equidistant, will have the same order of differences constant. [The proof of this is given by M. Maurice, but it is omitted here for the sake of brevity.]

Let there be two series, in one of which all the terms are given, and in the other only every h^{th}; thus,

v	v_1	v_2	v_3	v_4	$v_5 \ldots\ldots\ldots v_x$
$u, u_1 u_2 u_3 \ldots u_h u_{h+1} u_{h+2} u_{h+3} \ldots u_{2h} u_{h+1}$	$\ldots\ldots u_{3h}$	$\ldots\ldots u_{4h}$	$\ldots\ldots u_{5h}$	$\ldots\ldots u_{xh}$	

It is evident that if $v = u$ and $v_1 = u_h$ we shall have in every case

$$v_x = u_{xh}$$

Then denoting the differences of v by Δ, and those of u by δ, we shall have

$$u_1 = u + \delta u, \quad v_1 = v + \Delta v = u + \Delta v$$

whence $$\Delta v = v_1 - u = u_h - u,$$

consequently, since, by the ordinary expression in the calculus of differences,

$$u_h = (1+\delta)^h . u, \text{ we have}$$

$$\Delta v = \{(1+\delta)^h - 1\} . u$$

Also because $$v_1 = (1+\Delta) v = u_h = (1+\delta)^h u,$$

$$\therefore (1+\delta) . u = (1+\Delta)^{\frac{1}{h}} . v$$

and because $v = u$

$$\delta u = \{(1+\Delta)^{\frac{1}{h}} - 1\} . u$$

which becomes in its general form

$$\delta^m u = \{(1+\Delta)^{\frac{1}{h}} - 1\}^m . u \quad \ldots\ldots\ldots \quad (A)$$

So when $m = 1$, we have

$$\delta u = \left\{(1+\Delta)^{\frac{1}{h}} - 1\right\} u = \left\{\frac{\Delta}{h} + \frac{1.\overline{1-h}}{1.2} \cdot \frac{\Delta^2}{h^2} + \frac{1.\overline{1-h}.\overline{1-2h}}{1.2.3} \cdot \frac{\Delta^3}{h^3} + \ldots\ldots\right\} . u$$

Now let us take $h = 5$, and suppose $\Delta^4 u$ constant; and for shortness put $\frac{\Delta}{5} = k$; the co-efficient of $\frac{\Delta^2}{h^2} = a$; the co-efficient of $\frac{\Delta^3}{h^3} = b$; &c.

(1) $$\delta u = \{k + a\,k^2 + b\,k^3 + c\,k^4\}\,u.$$

Consequently $\delta^2 u$ will depend on the square of this value of δu; but, as we neglect the powers of k above the 4th, if we put $k + a\,k^2 = p$, and $b\,k^3 + c\,k^4 = q$, we see that in the development of $\delta^2 u = (p+q)^2 u$ we have to regard only the expression

$$\delta^2 u = (p^2 + 2\,p\,q)\,u,$$

which gives us, rejecting k^5 and k^6,

(2) $$\delta^2 u = \{k^2 + 2\,a\,k^3 + (a^2 + 2\,b)\,k^4\}\,u$$

Similarly $$\delta^3 u = (p+q)^3 u$$

$$= (p^3 + 3\,p^2\,q + \cdots)\,u$$

or rejecting the higher powers of k,

(3) $$\delta^3 u = \{k^3 + 3\,a\,k^4\}\,u$$

and

(4) $$\delta^4 u = \{k^4\}\,u$$

The numerical co-efficients are easily found.

$$\frac{1.\overline{1-h}}{1.2} = \frac{1.(-4)}{1.2} = -2 = a$$

$$a \cdot \frac{1-2h}{3} = -2 \cdot \frac{-9}{3} = 6 = b$$

$$b \cdot \frac{1-3h}{4} = 6 \cdot \frac{-14}{4} = -21 = c$$

also

$$2\,a = -4 \qquad a^2 + 2\,b = 16$$

$$3\,a = -6$$

which gives us, restoring $\frac{\Delta}{5}$, for which we used k,

$$\delta u = \frac{\Delta u}{5} - 2\frac{\Delta^2 u}{5^2} + 6\frac{\Delta^3 u}{5^3} - 21\frac{\Delta^4 u}{5^4}$$

$$\delta^2 u = \qquad \frac{\Delta^2 u}{5^2} - 4\frac{\Delta^3 u}{5^3} + 16\frac{\Delta^4 u}{5^4}$$

$$\delta^3 u = \cdots\cdots\cdots \frac{\Delta^3 u}{5^3} - 6\frac{\Delta^4 u}{5^4}$$

$$\delta^4 u = \cdots\cdots\cdots\cdots\cdots \frac{\Delta^4 u}{5^4}$$

It will be more simple first to apply this method of interpolation to cases in which we shall have integral results: to polygonal numbers, for instance, or to series of powers, as follows:—

Let it be required to interpolate 4 terms between each of the following, 816, 1771, 3276, 5456, 8436, 12341.

By a process exactly the same as is exhibited on page 145, we have

u	Δu	$\Delta^2 u$	$\Delta^3 u$	$\Delta^4 u$
816				
	955			
1771		550		
	1505		125	
3276		675		0
	2180		125	
5456		800		0
	2980		125	
8436		925		
	3905			
12341				

Here then $h=5$ and $\Delta^3 u$ is constant; $\Delta^4 u$ and all higher $=0$.

$$\Delta u = 955 \qquad \therefore \frac{\Delta u}{h} = 191$$

$$\Delta^2 u = 550 \qquad \therefore \frac{\Delta^2 u}{h^2} = 22$$

$$\Delta^3 u = 125 \qquad \therefore \frac{\Delta^3 u}{h^3} = 1$$

(where 191, 22, and 1 answer respectively to a, b, and c, in the formula at the bottom of page 145).

Consequently $\delta u = 191 - 2.22 + 6.1 + 0 = 153$

$$\delta^2 u = \quad 22 - 4.1 + 0 = 18$$

$$\delta^3 u = \ldots\ldots\ldots\ldots 1 + 0 = 1$$

We are now prepared to proceed in finding the first four of the numbers required to be interpolated (compare with Abstract G, page 146).

u	δu	$\delta^2 u$	$\delta^3 u$
816			
	153		
969		18	
	171		1
1140		19	
	190		1
1330		20	
	210		
1540		21	
	231		
1771		22	
	253		

In the next step we proceed in precisely the same way; only using the next series of differences, 1505, 675, 125, instead of 955, 550, 125. And in like manner of the rest. But as the third differences are constant the process of finding the succeeding terms may be carried on by simple addition.

But if we attempt to find the last four numbers required in the same manner as we found the first, we can no longer take the differences in the same order of position as before. We are compelled to go upwards, and to take as the Δu for interpolating between 8436 and 12341, the numbers 3905, 925, and 125.

Now, having inverted the direction in which we have taken the Δu, we must invert the numbers between which we propose to interpolate.

In this case Δu will be negative, and must be written -3905;

$\Delta^2 u$ ... positive, and remains unaltered, 925;

$\Delta^3 u$ ... negative, and must be written -125;

consequently $\frac{\Delta u}{5} = -781$; $\frac{\Delta^2 u}{5^2} = 37$; $\frac{\Delta^3 u}{5^3} = -1$.

Whence $\delta u = -781 - 2.37 - 6.1 = -861$

$\delta^2 u = \quad 37 + 4 = 41$

$\delta^3 u = \quad -1 = -1$

And the last four of the required numbers are found as here shewn:—

u	δu	$\delta^2 u$	$\delta^3 u$
12341			
	−861		
11480		41	
	−820		−1
10660		40	
	−780		
9880		39	
	−741		
9139		38	
	−703		
8436			

We now give an example in which the differences are not constant till we reach a higher order,—the fifth. Let the given series be 32768, 161051, 537824, 1419857, 3200000, 6436343, and 11881376, to interpolate two terms between each.

$h=3$, and $\Delta^5 u$ is constant,

Making $u=32768$, $\Delta u = 128283$ $\therefore$ $\frac{\Delta u}{3} = 42761$

$\Delta^2 u = 248490$ $\quad \frac{\Delta^2 u}{3^2} = 27610$

$\Delta^3 u = 256770$ $\quad \frac{\Delta^3 u}{3^3} = 9510$

$\Delta^4 u = 136080$ $\quad \frac{\Delta^4 u}{3^4} = 1680$

$\Delta^5 u = 29160$ $\quad \frac{\Delta^5 u}{3^5} = 120$

Referring to Equation (A) above, page 206, and making m equal successively to 1, 2, 3, 4, and 5, we have, rejecting the powers of k above the 5th,

$$\delta u = \{k + a k^2 + b k^3 + c k^4 + d k^5\} u$$

$$\delta^2 u = \{k^2 + 2a k^3 + (a^2 + 2b) k^4 + 2(ab + c) k^5\} u$$

$$\delta^3 u = \{k^3 + 3a k^4 + 3(a^2 + b) k^5\} u$$

$$\delta^4 u = \{k^4 + 4a k^5\} u$$

$$\delta^5 u = \{k^5\} u$$

For the numerical co-efficients we obtain

$$\frac{1.\overline{1-h}}{1.2} = -1 \qquad = a$$

$$a.\frac{1-2h}{3} = (-1)\cdot\left(-\frac{5}{3}\right) = \frac{5}{3} \qquad = b$$

$$b.\frac{1-3h}{4} = \frac{5}{3}(-2) = \quad -\frac{10}{3} \qquad = c$$

$$c.\frac{1-4h}{5} = \left(-\frac{10}{3}\right)\cdot\left(-\frac{11}{5}\right) = \frac{22}{3} = d.$$

$$2a = -2 \qquad a^2 + 2b = 1 + \frac{10}{3} = \frac{13}{3} \qquad 2(ab+c) = -10$$

$$3a = -3 \quad 3(a^2+b) = 3\left(1+\frac{5}{3}\right) = 8$$

$$4a = -4.$$

In this case, the formula at the bottom of page 143 no longer serves us; first, because we have to interpolate two terms instead of five, which changes the co-efficients, and secondly, because the differences are carried farther, giving more steps in the process.

Putting $\frac{\Delta u}{h} = a$, $\frac{\Delta^2 u}{h^2} = b$, $\frac{\Delta^3 u}{h^3} = c$, $\frac{\Delta^4 u}{h^4} = d$, and $\frac{\Delta^5 u}{h^5} = e$, the formula for the present case is:—

$$\delta u = a - b + \frac{5}{3}c - \frac{10}{3}d + \frac{22}{3}e = 26281$$

$$\delta^2 u = \quad b - 2c + \frac{13}{3}d - 10e = 14670$$

$$\delta^3 u = \quad c - 3d + 8e = 5430$$

$$\delta^4 u = \quad d - 4e = 1200$$

$$\delta^5 u = \quad e = 120$$

Whence the terms succeeding 32768 are 59049 and 100000, and we have the power of continuing the series as far as may be necessary; the successive differences being formed by simple addition.

In applying this method to the interpolation of mortality, it must be observed that in such investigations we very rarely, if ever, meet with any order of differences constant, or even the same for two successive periods. The differences generally vary for every period for which we have to interpolate, and it is assumed that the second or third or other difference, as the case may be, is constant during the period of two, three, or five years, to which we are for the time being paying attention. Every separate period requires its own particular calculation, because the process cannot be carried on as in the instances given above, without a fresh calculation of δu, $\delta^2 u$, $\delta^3 u$, &c.

In consequence of the assumption that the differences of a certain order are constant, when in strict correctness they are not, the method of calculation by inverted differences as described above (pp. 209–10) is sometimes adopted, and found to produce greater verisimilitude. The ordinary procedure is generally preferable, but frequently there is special reason foremploying the other.

The following shews how easily the method is applied to various cases:—

Suppose we have to interpolate six terms, fourth differences being constant.

$$a = \frac{\Delta u}{7}; \quad b = \frac{\Delta^2 u}{7^2}; \quad c = \frac{\Delta^3 u}{7^3}; \quad d = \frac{\Delta^4 u}{7^4}:—$$

$$\delta u = a - 3\,b + 13\,c - 65\,d$$

$$\delta^2 u = \qquad b - \ 6\,c + 35\,d$$

$$\delta^3 u = \qquad\qquad c - \ 9\,d$$

$$\delta^4 u = \qquad\qquad\qquad d$$

If the third differences are constant the fourth are 0: in that case $65\,d$, and the terms that stand below it $= 0$, and are neglected.

This explanation will, it is hoped, render the method of interpolation adopted in this volume quite intelligible.

The construction of Table III depends on the following principles:—

If, at a given age, d be the mortality per cent., $\frac{d}{100}$ is the probability of the death of a single individual. The sum of the probabilities of two incompatible events $= 1$. Consequently the probability of any individual of the given age living for a year longer is $1 - \frac{d}{100}$. Similarly with regard to the mortality and probability at any other age.

Let d_m, d_{m+1}, d_{m+2}, ... d_{m+x} represent the mortality per cent. at the ages m, $m+1$, $m+2$, &c. up to $m+x$: and let l_m denote the number living at the age m, and l_{m+x} the number living at the age $m+x$, then

$$l_{m+x}=l_m\left(1-\frac{d_m}{100}\right)\cdot\left(1-\frac{d_{m+1}}{100}\right)\cdot\left(1-\frac{d_{m+2}}{100}\right)\cdot\ldots\ldots\ldots\cdot\left(1-\frac{d_{m+x-1}}{100}\right)$$

Make m the initial age of the Table; and let l_m be the radix (in this Table $l_m = 100{,}000$): the numbers living at each successive age are found by the process just given. The numbers of intemperate persons living at any specified age, are, on the average and in the long run, the same proportion of the number that enter on the destructive habit, as the number opposite the age in column 4 of this Table is of 100,000.

Table II.

Interpolation of Mortality per Cent.

Interval $= \frac{1}{5}$.

(1) = Original Quantities.

Δ_1 and Δ_2 = 1st and 2nd Differences.

$a = \cdot 2\ \Delta_1$

$b = \cdot 04\ \Delta_2$

Age.	(1.)	Δ_1	Δ_2
16	1·342	+ 3·611	— 3·944
		+ ·7222 = a	— ·15776 = b
26	4·953	— ·333	+ 1·705
		— ·0666	+ ·06820
36	4·620	+ 1·372	— ·946
		·2744	— ·03784
46	5·992	·426	+ 1·148
		·0852	·04592
56	6·418	1·574	8·616
		·3148	+ ·34464
66	7·992	10·190	— 8·372
		2·0380	— ·33488
76	18·182	1·818	
		+ ·3636	
86	20·000		

(1) = Interpolated Quantities, $\delta_1 = a - 2b$, $\delta_2 = b$.

Age.	(1.)	δ_1	Age.	(1.)	δ_1
16	**1·342**		**56**	**6·418**	
		+ 1·03772			− ·37448
18	2·37972		58	6·04352	
		·87996			− ·02984
20	3·25968		60	6·01368	
		·72220			+ ·31480
22	3·98188		62	6·32848	
		·56444			·65944
24	4·54632		64	6·98792	
		+ ·40668			1·00408
26	**4·953**		**66**	**7·992**	
		− ·20300			2·70776
28	4·75000		68	10·69976	
		·13480			2·37288
30	4·61520		70	13·07264	
		− ·06660			2·03800
32	4·54860		72	15·11064	
		+ ·00160			1·70312
34	4·55020		74	16·811376	
		·06980			1·36824
36	**4·620**		**76**	**18·182**	
		·35008			1·03336
38	4·97008		78	19·21536	
		·31224			·69848
40	5·28232		80	19·91384	
		·27440			·36360
42	5·55672		82	20·27744	
		·23656			+ ·02872
44	5·79328		84	20·30616	
		+ ·19872			− ·30616
46	**5·992**		**86**	**20·000**	...
		− ·00664			
48	5·98536		...	...	...
		+ ·03928			
50	6·02464		...	...	...
		·08520			
52	6·10984		...	...	...
		·13112			
54	6·24096		...	...	...
		+ ·17704			

Second Interpolation.

Interval $= \frac{1}{2}$.

$$d_1 = \frac{4}{10}\delta_1 - \frac{12}{100}\delta_2.$$

Age.	(1).	d_1	Age.	(1).	d_1	Age.	(1).	d_1
20	3·260		47	5·984		74	16·814	
		+·308						+·587
21	3·568		48	5·985		75	17·401	
					+·010			
22	3·982		49	5·995		76	18·182	
		·245						·453
23	4·127		50	6·055		77	18·635	
					·029			
24	4·546		51	6·054		78	19·215	
		+·182						·319
25	4·726		52	6·110		79	19·534	
					·469			
26	4·953		53	6·579		80	19·914	
		−·089						·186
27	4·864		54	6·241		81	20·100	
					+·065			
28	4·750		55	6·306		82	20·277	
		·062						+·052
29	4·688		56	6·418		83	20·322	
					−·191			
30	4·615		57	6·227		84	20·306	
		·025						−·082
31	4·590		58	6·044		85	20·224	
					−·053			
32	4·549		59	5·991		86	20·098	
		−·008						
33	4·541		60	6·014		87	21·777	
					+·085			
34	4·550		61	6·099		88	23·095	
		+·020						
35	4·570		62	6·328		89	24·687	
					·282			
36	4·620		63	6·610		90	26·277	
		·145						
37	4·765		64	6·988		91	27·877	
					·360			
38	4·970		65	7·348		92	29·582	
		·130						
39	5·100		66	7·992		93	31·127	
					1·123			
40	5·282		67	9·115		94	32·817	
		·114						
41	5·396		68	10·700		95	34·297	
					·989			
42	5·557		69	11·689		96	35·572	
		·099						
43	5·656		70	13·073		97	36·644	
					·855			
44	5·793		71	13·928		98	37·482	
		+·084						
45	5·877		72	15·111		99	38·066	
					·721			
46	5·992		73	15·832		100	38·650	
		−·008						

Table III.

Decrements and Rate of Mortality.—Intemperance.

Age.	Mortality per Cent. $= a.$ $1-\frac{a}{100}.$	$5+\Sigma(c)=\lambda l.$ $\lambda\left(1-\frac{a}{100}\right)=c$	Number Living. $= l.$	Number Dying.	Age.	Mortality per Cent. $= a.$ $1-\frac{a}{100}.$	$5+\Sigma(c)=\lambda l.$ $\lambda\left(1-\frac{a}{100}\right)=c$	Number Living. $= l.$	Number Dying.
20	3·260	5·00000	100,000	3,259	46	5·992	4·44849	28,086	1,683
	·96740	9·98561				·94008	9·97316		
21	3·568	4·98561	96,741	3,452	47	5·984	·42165	26,403	1,580
	·96432	·98422				·94016	·97320		
22	3·982	·96983	93,289	3,715	48	5·985	·39485	24,823	1,486
	·96018	·98235				·94015	·97320		
23	4·127	·95218	89,574	3,697	49	5·995	·36805	23,337	1,399
	·95873	·98170				·94005	·97315		
24	4·546	·93388	85,877	3,902	50	6·025	·34120	21,938	1,321
	·95454	·97980				·93975	·97302		
25	4·726	·91368	81,975	3,873	51	6·054	·31422	20,617	1,248
	·95274	·97898				·93946	·97288		
26	4·953	·89266	78,102	3,868	52	6·110	·28710	19,369	1,184
	·95047	·97794				·93890	·97262		
27	4·864	·87060	74,234	3,612	53	6·579	·25972	18,185	1,196
	·95136	·97834				·93421	·97045		
28	4·750	·84894	70,622	3,355	54	6·241	·23017	16,989	1,060
	·95250	·97886				·93759	·97202		
29	4·688	·82780	67,267	3,153	55	6·306	·20219	15,929	1,004
	·95312	·97915				·93694	·97171		
30	4·615	·80695	64,114	2,959	56	6·418	·17390	14,925	958
	·95385	·97948				·93582	·97119		
31	4·590	·78643	61,155	2,808	57	6·227	·14509	13,967	870
	·95410	·97959				·93773	·97208		
32	4·549	·76602	58,347	2,654	58	6·044	·11717	13,097	792
	·95451	·97978				·93956	·97292		
33	4·541	·74580	55,693	2,529	59	5·991	·09009	12,305	737
	·95459	·97982				·94009	·97317		
34	4·550	·72562	53,164	2,418	60	6·014	·06326	11,568	696
	·95450	·97978				·93986	·97306		
35	4·570	·70540	50,746	2,320	61	6·099	·03632	10,872	663
	·95430	·97968				·93901	·97267		
36	4·620	·68508	48,426	2,238	62	6·328	4·00899	10,209	646
	·95380	·97946				·93672	·97161		
37	4·765	·66454	46,188	2,199	63	6·610	3·98060	9,563	632
	·95235	·97880				·93390	·97030		
38	4·970	·64334	43,989	2,187	64	6·988	·95090	8,931	624
	·95030	·97786				·93012	·96854		
39	5·100	·62120	41,802	2,131	65	7·348	·91944	8,307	610
	·94900	·97727				·92652	·96686		
40	5·282	·59847	39,671	2,096	66	7·992	·88630	7,697	615
	·94718	·97643				·92008	·96383		
41	5·396	·57490	37,575	2,027	67	9·115	·85013	7,082	646
	·94604	·97591				·90885	·95850		
42	5·557	·55081	35,548	1,976	68	10·700	·80863	6,436	688
	·94443	·97517				·89300	·95085		
43	5·656	·52598	33,572	1,898	69	11·689	·75948	5,748	672
	·94344	·97472				·88311	·94602		
44	5·793	·50070	31,674	1,835	70	13·073	·70550	5,076	664
	·94207	·97409				·86927	·93916		
45	5·877	4·47479	29,839	1,753	71	13·928	3·64466	4,412	614
	·94123	9·97370				·86072	9·93486		

TABLE III.—*(continued.)*

Age.	Mortality per Cent. $= a.$ $1-\frac{a}{100}.$	$5+\Sigma(c)=\lambda l.$ $\lambda\left(1-\frac{a}{100}\right)=c$	Number Living. $= l.$	Number Dying.	Age.	Mortality per Cent $= a.$ $1-\frac{a}{100}.$	$5+\Sigma(c)=\lambda l.$ $\lambda\left(1-\frac{a}{100}\right)=c$	Number Living. $= l.$	Number Dying.
72	15·111	3·57952	3,798	574	87	21·777	2·22168	167	37
	·84889	9·92886				·78223	9·89334		
73	15·832	·50838	3,224	510	88	23·095	·11502	130	30
	·84168	·92515				·76905	·88596		
74	16·814	·43353	2,714	454	89	24·687	2·00098	100	25
	·83186	·92005				·75313	·87687		
75	17·401	·35358	2,257	393	90	26·277	1·87785	75	19
	·82599	·91698				·73723	·86761		
76	18·182	·27056	1,864	339	91	27·877	·74546	56	16
	·81818	·91285				·72123	·85808		
77	18·635	·18341	1,525	284	92	29·582	·60354	40	12
	·81365	·91044				·70418	·84769		
78	19·215	·09385	1,241	238	93	31·127	·45123	28	9
	·80785	·90733				·68873	·83805		
79	19·534	3·00118	1,003	196	94	32·817	·28928	19	6
	·80466	·90561				·67183	·82726		
80	19·914	2·90679	807	161	95	34·297	1·11654	13	4
	·80086	·90356				·65703	·81759		
81	20·100	·81035	646	130	96	35·572	0·93413	9	3
	·79900	·90255				·64428	·80908		
82	20·277	·71290	516	104	97	36·644	·74321	6	2
	·79723	·90159				·63356	·80179		
83	20·322	·61449	412	84	98	37·482	·54500	4	2
	·79678	·90134				·62518	·79601		
84	20·306	·51583	328	67	99	38·066	·34101	2	1
	·79694	·90142				·61934	·79193		
85	20·224	·41725	261	52	100	38·650	0·13294	1	1
	·79776	·90187				·61350	9·78781		
86	20·098	2·31912	209	42					
	·79902	9·90256							

By an inspection of the figures in Table IV which is derived from Table III, it will be seen that an intemperate person of age 20 has an equal chance of living 15·6 years; while a person of the general population of the country at the same age has an equal chance of living 44·2 years longer. Again, at age 30, the intemperate person has an equal chance of 13·8 years, and the other of 36·5 years. Also, at age 40, the chance of the one is 11·6 years, and of the other 28·8 years. The following will shew the results at different ages:—

TABLE IV.

Equation of Life, being the Period of Years of which there is an equal chance of living, among the

Ages.	General Population, England and Wales.	Persons of Intemperate Habits.	
20	44·212	15·557, being 35 per cent.	of the duration of life in the general population.
30	36·482	13·800, ... 38 ...	
40	28·790	11·627, ... 40 ...	
50	21·255	10·860, ... 51 ...	
60	14·285	8·947, ... 63 ...	

It would be curious to contrast with the above results the rate of mortality among persons who have been for a considerable period of years, or for the whole of life, abstainers from intoxicating drinks; but, unfortunately, there are no available data connected with this class of lives, and it seems there will long be considerable difficulty in procuring such information. A few years ago, Mr. Munro, of Enfield, at much trouble and expense, procured returns from Rechabite societies, shewing the rate of mortality and sickness experienced by the members, and it is known that the results, although not published, exhibit as high a rate of mortality and sickness as is found to prevail among the members of other friendly societies. The facts collected by Mr. Munro are of great value, and it is to be regretted that the societies furnishing them should, on account of the unfavourable nature of the results arrived at, object to their publication. For, although they shew a high rate of mortality, it should be kept in view that all the members cannot yet be fairly considered as the type of genuine abstainers; many of them are reformed drunkards, and, as such, have become teetotallers, with broken-down constitutions. It may therefore be justly stated, that until Rechabite societies have enrolled a class of members who have been abstainers from infancy, they cannot expect an entire immunity from those diseases and deteriorating influences on health to which less careful members of the community are subject.

In a most valuable paper read before the Statistical Society by Colonel Sykes, in the year 1851, will be found some remarkable facts as to the influence of intemperance on the sickness and mortality of European troops in the Madras presidency. Mr. Balfour, in his paper on Cholera, also gives some striking examples of the same class of results.

The facts collected in the preceding Schedule required an enumeration of the peculiar features of the intemperance in respect to the favourite beverage; and it is curious to remark the influence of the different kinds of drink on the duration of life.

The average duration of life, after the commencement of the intemperate habits, is,

Among beer drinkers	21·7 years.
... spirit drinkers	16·7 ...
And among those who drink both spirits and beer indiscriminately .	16·1 ...

and, consequently, the rate of mortality will be,

Among beer drinkers	4·597 per cent. yearly.
... spirit drinkers	5·996 ... ...
... mixed drinkers	6·194 ... ...

Intemperate indulgence in the use of distilled liquors is hence more hurtful to health than the like use of fermented liquors, but the immoderate use of both combined is more injurious than the exclusive use of the one kind only.

These results are, however, not more curious than those connected with the different classes of persons.

The following shews the average duration of life, after the commencement of intemperate habits, among different classes of persons, namely:—

Among mechanics, working and labouring men . . 18 years.
... traders, dealers, and merchants . . . . . 17 ...
... professional men and gentlemen . . . . 15 ...
... females . . . . . 14 ...

Among the general population, the distinction observable between the first two and the third of the classes is also known to exist, and the more regular and active physical exercises to which the members of the first two groups are subject, are very probably to a great extent the cause of the difference not only among the general population, but also among the intemperate persons now under observation.

It is obvious that none of the public records of this country connected with the hospitals or other public institutions, nor the returns of the Registrar-General, afford any means of knowing or ascertaining the number of deaths which take place from the use of intoxicating drinks. It is believed, that the present materials furnish better evidence on this question than anything else extant. In the returns of the Registrar-General, the nosological system adopted indicates what were the habits of the persons whose deaths are recorded in two instances only, namely, when the immediate cause of death appears under the term *delirium tremens*, or *intemperance*. It is, therefore, evident that those must embrace but a very small number of the deaths which actually take place among persons addicted to intemperate habits.

The following Table shews the deaths which happened from different causes among the facts now collected:—

TABLE V.

Immediate Cause of Death.

Immediate Cause of Death.	Number of Deaths at the following Ages:														
	16 to 20.	21 to 25.	26 to 30.	31 to 35.	36 to 40.	41 to 45.	46 to 50.	51 to 55.	56 to 60.	61 to 65.	66 to 70.	71 to 75.	76 to 80.	81 to 85.	86 to 90.
Apoplexy	..	..	2	1	5	4	5	2	2	1	1	..	1	..	..
Brain	..	..	..	1	..	1	..	1	..	..	..	..	..	..	..
Inflammation of Brain	..	..	..	..	1	..	1	..	1	..	..	..	..	..	..
Paralysis	..	..	1	..	..	..	1	..	..	..	1	2	..	..	..
Brain Fever	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Insanity	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..
	..	..	3	3	7	5	7	3	4	1	2	2	1	..	..
Delirium Tremens	..	2	7	10	16	10	5	3	2	..	..	2	..	..	..
Tetanus	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..
	..	2	10	13	23	15	13	6	7	1	2	4	1	..	..
Disease of Chest	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Decay of Nature	..	..	..	..	1	..	..	..	1	..	..	..	..	1	1
Phthisis	..	5	7	6	5	4	6	6	1	..	..	..	..	..	..
Atrophy	..	..	1	..	..	3	3	..	..	1	2	..	..	..	..
Cancer of Gums and Tongue	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Inflammation of Lungs	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..
Hydrothorax	..	..	..	..	..	..	1	..	..	1	1	..	..	..	..
Pulmonary Consumption	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..
Pneumonia	..	..	3	..	1	1	..	1	..	..	..	..	..	..	..
Empyema	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Decline	..	..	..	..	1	1	..	1	..	..	..	..	..	..	..
Bronchitis	1	..	..	..	1	..	..	..	2	1	..	..	..	..	..
Asthma	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..
Hæmoptysis	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..
	1	6	12	7	11	11	10	8	5	4	5	..	..	1	1

TABLE V.—*(continued.)*

Immediate Cause of Death.	Number of Deaths at the following Ages:														
	16 to 20.	21 to 25.	26 to 30.	31 to 35.	36 to 40.	41 to 45.	46 to 50.	51 to 55.	56 to 60.	61 to 65.	66 to 70.	71 to 75.	76 to 80.	81 to 85.	86 to 90.
Liver Disease and Dropsy	..	1	1	2	..	2	2	3	2	2	2	2	1	..	..
Dropsy	..	1	1	2	3	3	3	..	5	2	2	4	..	..	..
Stomach Disease	..	1	..	..	1	..	2	1	2	..	1	..	..	..	..
Liver Disease	..	..	1	..	1	3	6	3	2	..	3	..	..	..	..
Liver Disease, Atrophy	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Disease of Viscera	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Hepatitis	..	..	..	..	..	..	..	1	..	1	2	1	..	..	..
Ascites	..	1	..	1	..	..	..	..	..	1	..	..	..	..	..
	..	4	3	6	6	8	13	8	11	6	10	7	1	..	..
Gout	..	..	..	..	..	2	..	..	1	..	..	..	..	..	..
Rheumatism	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..
Heart Disease	..	..	..	..	1	1	1	..	..	..	..	..	..	..	..
Aneurism	..	..	..	1	..	1	1	..	..	..	..	..	..	..	..
	..	..	..	1	2	4	2	..	2	..	..	..	..	..	..
Urinary Organs	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Enteritis	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Retention of Urine	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Ulceration of Bladder	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Disease of Kidneys	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Ileus	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
	..	..	..	..	..	..	2	1	..	1	..	1	..	1	..
Peritonitis	..	..	2	..	1	..	..	..	..	..	..	..	..	..	..
Ulceration of Bowels	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Gastro-Enteritis	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..
Intussusception	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..
	..	..	2	..	1	..	..	..	..	1	3	..	..	..	..
Typhus Fever	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Fever	..	..	1	2	1	2	..	..	1	..	..	..	..	..	..
Inflammation and Gastric Fever	..	..	..	..	1	1	..	..	1	2	..	..	..	..	..
	..	1	1	2	2	3	..	..	2	2	..	..	..	..	..
Cholera	..	..	..	..	1	1	1	..	..	..	..	..	..	..	..
Diarrhœa	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
	..	..	..	..	1	1	1	..	..	1	..	..	..	..	..
Suicide	..	2	1	1	2	2	1	..	..	..	..	..	..	..	..
Found Drowned	..	..	..	2	2	1	..	..	1	..	..	..	..	..	..
Falls	..	1	1	..	1	..	2	..	1	..	..	1	..	..	..
Not stated	..	..	..	..	2	1	..	..	4	..	3	2	..	..	..
Erysipelas	..	..	..	..	..	1	1	1	..	..	..	1	..	..	..
Coma	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..
Gangrene	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Intoxication	..	..	..	..	..	3	2	1	2	..	..	..	..	..	..
Syphilis	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..
Injury of Testicle	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Hæmatemesis	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..
Burns	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
	..	1	2	2	6	7	5	4	8	..	4	6	..	..	..

The following Abstract of this Table will give a condensed view of the general results arrived at:—

ABSTRACT B.

Immediate Cause of Death.

Immediate Cause of Death.	Number of Deaths at the following Ages:															Total.
	16 to 20.	21 to 25.	26 to 30.	31 to 35.	36 to 40.	41 to 45.	46 to 50.	51 to 55.	56 to 60.	61 to 65.	66 to 70.	71 to 75.	76 to 80.	81 to 85.	86 to 90.	
Head Diseases	...	2	10	13	23	15	13	6	7	1	2	4	1	...	...	97
Respiratory Organs	1	6	12	7	11	11	10	8	5	4	5	...	...	1	1	82
Liver Disease and Dropsy	...	4	3	6	6	8	13	8	11	6	10	7	1	...	...	83
Gout, Rheumatism, and Heart	...	...	...	1	2	4	2	...	2	...	...	...	...	...	...	11
Urinary Organs	...	...	...	...	...	...	2	1	...	1	...	1	...	1	...	6
Bowel Disease	...	...	2	...	1	...	...	...	...	1	3	...	...	...	...	7
Fevers	...	1	1	2	2	3	...	...	2	2	...	...	...	...	...	13
Cholera and Diarrhœa	...	...	...	...	1	1	1	...	...	1	...	...	...	...	...	4
Suicide	...	2	1	1	2	2	1	...	...	...	...	...	...	...	...	9
Other Diseases	...	1	2	2	6	7	5	4	8	...	4	6	...	...	...	45
Total	1	16	31	32	54	51	47	27	35	16	24	18	2	2	1	357
		47		86		98		62		40		20		3		
Delirium Tremens, included in Head Diseases	...	2	7	10	16	10	5	3	2	...	...	2	...	...	...	57
Intemperance	...	...	...	...	...	3	2	1	2	...	...	...	...	...	...	8
		9		26		20		8				2				65
Or one in	...	5·22		3·31		4·90		7·75		...		10·00		...		

From which it appears that the greatest number of deaths took place from Head diseases (Nervous system), namely, 97, of which 57 are recorded under the term "delirium tremens." The next in order are Disease of the liver, Dropsy, &c., and nearly the same number from Diseases of the respiratory organs. These results are rather curious, as shewing the very marked influence which intemperate habits have on the cause of death. Among the population of England and Wales, aged 20 and upwards, the deaths from Head diseases (Nervous System) constitute only 9·710 per cent. of the deaths from all causes at those ages; but among the intemperate classes they constitute 27·100 per cent., being nearly three times as great. With other diseases, similar differences will be found. In the general community, the deaths from Diseases of the respiratory organs, at the same periods of life, amount to 33·150 per cent. of the deaths from all causes; while among the intemperate group they are only 22·980 per cent. of all the deaths. The following figures exhibit these relations for England and Wales, for the Gotha Life Office, the "Scottish Widows' Fund" and the "Standard Assurance Company," (the last three being select classes, the details of which will be found in the preceding contribution), and also for intemperate lives.

ABSTRACT C.

Ratio per Cent. of Deaths, at ages 20 and upwards, from different causes, to the Total Deaths, from all causes, at the corresponding ages, in

Cause of Death.	England and Wales, 1847.	Gotha Life Office. 1839-49.	Scottish Widows' Fund. 1815-52.	Standard Life Office. 1846-50.	Intemperate Lives.
Head diseases	9·710	15·176	21·246	18·089	27·10
Digestive organs	6·240	8·377	12·838	11·945	23·30
Respiratory organs	33·150	27·843	21·096	22·867	22·98
Total of the above three classes	49·100	51·396	55·180	52·901	73·38

In England and Wales, the above three groups of diseases constitute 49·100 per cent. of the whole deaths; but in the intemperate class of lives they form 73·38 per cent. The most remarkable peculiarity in this respect is, however, the excessive development among intemperate persons of diseases of the Nervous system and of the Digestive organs. In England and Wales, these two groups form 15·950 per cent. of the deaths from all causes at the corresponding ages; but amongst intemperate persons, they form 50·40 per cent. of all the deaths which take place, or more than three times the general average. These may, therefore, be regarded as the distinctive type of the causes of death among intemperate persons; and the predominance of deaths assigned to such causes in any particular collection of facts, may fairly, in the absence of other and more direct evidence, lead to the inference of irregularity of habits having prevailed to an unusual extent. An inspection of the results given for the "Scottish Widows' Fund" immediately strikes the attention with the marked characteristics of this circumstance; there is an excess of the diseases of the Nervous system and Digestive organs, and a diminution of those of the Respiratory organs, being the same features, although not developed in so marked a degree, which are observable in the decidedly intemperate group of lives. The following shews that the results for the "Standard Life Office," but more particularly for the "Scottish Widows' Fund," hold something like an intermediate place between those for England and Wales generally, and the "intemperate group:"—

ABSTRACT D.

Group of Facts.	Ratio per Cent. to Total Deaths of Deaths from Diseases of the	
	Nervous System and Digestive Organs.	Respiratory Organs.
England and Wales	15·950 per cent.	33·150 per cent.
Standard Life Office	30·034 ...	22·867 ...
Scottish Widows' Fund . . .	34·084 ...	21·096 ...
Intemperate Lives	50·400 ...	22·980 ...

Dr. Begbie, in his interesting report on the mortality of the "Scottish Widows' Fund," although alluding to the fact that several of the persons who died from diseases of the digestive organs were reported "free livers," still seems not to have been impressed with the remarkably high ratio of deaths from this cause in the materials before him: and the same observation applies to Professor Christison's paper.

It has been said that the returns of the Registrar-General do not afford the means of determining the number of deaths which take place in this country from the use of intoxicating drinks; but if viewed in connection with the data brought forward in this paper, it is obvious that a means is now supplied of making a near approximation to the results required: and, with this view, attention is directed to the following Table:—

TABLE VI.

Deaths in England and Wales, 1847, from

Age.	Delirium Tremens.			Intemperance.			Both.			All Causes.		
	Males.	Females.	Both.	Males.	Females.	Both.	Males.	Females.	Both.	Males.	Females.	Both.
16 to 20	2	...	2	5	...	5	7	...	7	6,615	7,126	13,741
21 ... 30	59	9	68	23	12	35	82	21	103	15,457	16,514	31,971
31 ... 40	153	13	166	39	17	56	192	30	222	13,459	15,010	28,469
41 ... 50	131	18	149	46	17	63	177	35	212	14,044	13,379	27,423
51 ... 60	43	4	47	43	17	60	86	21	107	14,596	13,666	28,262
61 ... 70	26	6	32	23	6	29	49	12	61	17,923	18,048	35,971
71 ... 80	9	1	10	5	1	6	14	2	16	19,292	21,334	40,626
81 ... 90	1	1	2	...	1	1	1	2	3	10,138	12,179	22,317
	424	52	476	184	71	255	608	123	731	111,524	117,256	228,780

The deaths recorded "delirium tremens" and "intemperance," as will be seen on referring to Abstract B, preceding, constitute but a small portion of the total deaths taking place among persons addicted to intemperate habits; and the following Table is prepared to shew the rate of mortality for each sex and term of life in England and Wales from those two specified causes:—

Table VII.

Age.	Log. of Annual Rate of Increase of Population. (1)	6 × (1) (2) / λ Population in 1841 (3)	Population in 1847. Number Dying × 100 from Delirium Tremens and Intemperance. (4).	(2) + (3) / λ (4)	λ Mortality per Cent.	Mortality per Cent.
Males.						
16 to 20	0·0065216	0·0391296	854,600	5·9317623	6·9133257	·00082
		5·8926327	700	2·8450980		
21 ... 30	·0095741	·0574446	1,521,610	6·1823033	7·7315106	·00539
		6·1248587	8,200	3·9138139		
31 ... 40	·0085533	·0513198	1,124,308	6·0508853	8·2324159	·01708
		5·9995655	19,200	4·2833012		
41 ... 50	·0067954	·0407724	822,161	5·9149567	8·3330166	·02153
		·8741843	17,700	4·2479733		
51 ... 60	·0053307	·0319842	534,419	5·7278816	8·2066169	·01609
		·6958974	8,600	3·9344985		
61 ... 70	·0044890	·0269340	350,649	5·5448725	8·1453236	·01397
		·5179385	4,900	3·6901961		
71 ... 80	·0043558	·0261348	169,447	5·2290339	7·9170941	·00826
		5·2028995	1,400	3·1461280		
81 ... 90	0·0044547	0·0267282	43,841	4·6418783	7·3581217	·00228
		4·6151501	100	2·0000000		
Females.						
16 ... 20	0·0059608	0·0357648	874,197	5·9416092	...	...
		5·9058444	...	...		
21 ... 30	·0081530	·0489180	1,677,442	6·2246475	7·0975718	·00125
		6·1757295	2,100	3·3222193		
31 ... 40	·0075728	·0454368	1,167,477	6·0672482	7·4098731	·00257
		6·0218114	3,000	3·4771213		
41 ... 50	·0066544	·0399264	852,367	5·9306268	7·6134412	·00411
		5·8907004	3,500	3·5440680		
51 ... 60	·0059566	·0357396	574,672	5·7594202	7·5627991	·00365
		·7236806	2,100	3·3222193		
61 ... 70	·0056652	·0339912	399,580	5·6016033	7·4775779	·00300
		·5676121	1,200	3·0791812		
71 ... 80	·0056223	·0337338	199,368	5·2996548	7·0013752	·00100
		5·2659210	200	2·3010300		
81 ... 90	0·0053864	0·0323184	57,271	4·7579360	7·5430940	·00349
		4·7256176	200	2·3010300		

The following Abstract of this Table shews the relation of mortality in the sexes from those causes:—viz. when "delirium tremens," or "intemperance" is recorded as the immediate cause of death.

Abstract E.

Age.	Mortality per Cent. from Delirium Tremens and specified Intemperance, amongst		
	Males, 1847.	Females, 1847.	Ratio of the Mortality of Females to Males.
21 to 30	·00539	·00125	23 per cent.
31 ... 40	·01708	·00257	15 ...
41 ... 50	·02153	·00411	19 ...
51 ... 60	·01609	·00365	23 ...
61 ... 70	·01397	·00300	22 ...
71 ... 80	·00826	·00100	12 ...

The figures in the last column shew that the mortality of the female sex is, on an average, about one-fifth of that of the males, varying from 23 per cent. at age 21–30, to 12 per cent. at age 71–80. It will likewise be seen that the maximum rate of mortality in both sexes is at the term of life 41–50 gradually increasing from the younger ages to that period, and then decreasing to the more advanced ages. The above rate of mortality must not be confounded with that given in Abstract A, which shewed, as is usual in tables of mortality, an increasing rate from the younger to the older ages. There is an important distinction between the two classes of facts. Abstract A shews the rate of mortality among a class of people all of whom have indulged in the immoderate use of intoxicating drinks, while the facts given immediately above shew the proportion of deaths from certain forms of intemperance in the community generally at the respective terms of life; and although it be true that the rate of mortality is higher in the decade 41–50, it is not to be inferred that intemperate habits have the most detrimental effect on the constitution at those ages, for Abstract A proves that as age increases, the baneful influence on health of strong drinks also increases; the legitimate inference to be drawn is, simply, that drinking habits are more prevalent at that term of life than at any other; in fact, the figures just given demonstrate that the folly of indulging in the intemperate use of strong drinks grows on the community from youth to the mature period of manhood, 41–50 years of age, after which time the man gets sobered into the more limited use of them, avoiding the excesses of earlier years.

But perhaps the most curious circumstance disclosed by the above figures is the remarkable similarity between the proportion of crime in the sexes to the proportion of deaths from assigned causes of intemperance. By referring to a subsequent contribution shewing the influence of age on the development of crime, it will be found that the tendency to crime in the male sex is nearly five times as great as in the female sex, or, more strictly, in the relation of 336 to 1581; while the ratio of deaths to the population from assigned intemperate causes, at age 20 and upwards, are in the exact relation 8011 to 36,769, a most remarkable agreement, the difference being under 2·5 per cent.; 7814 substituted for 8011 would give the precise relation of the figures shewing the tendency of crime in the sexes. This is rather a strange coincidence, to be hereafter referred to more in detail; and may be probably viewed by most careful observers as proving that crime legally considered, and intemperance in its ordinary acceptation, are the concomitants of each other.

So far the deaths from intemperate habits have been spoken of in regard to the general population of England and Wales, as recorded under assigned causes in the reports of the Registrar-General; but it must be evident that the deaths actually occasioned, or, at all events, hastened, by extreme indulgence in intoxicating liquors, far exceeds those nominally recorded in the official returns as proceeding from this cause. This is satisfactorily proved by the facts in Table V and Abstract B. And, assuming that in the country generally the deaths in the Registrar-General's returns from intemperance would bear the

same relation to those under assigned causes, which the more careful observation of the facts analysed in Abstract B shews, it becomes a very easy matter to determine the number and ratio of deaths which actually take place among intemperate persons in England and Wales. On this hypothesis the following Table has been constructed: the numbers in the second and sixth columns consist of the product of the numbers in the lowest horizontal line of Abstract B, page 221, and the numbers for the corresponding ages in columns 8 and 9 of Table VI, page 223.

TABLE VIII.

Intemperance—England and Wales, 1847.

Age.	Males.				Females.			
	Number Dying from Intemperance. (1)	λ((1)×100)(2) / λ Population. (3)	(2)—(3).	Mortality per Cent.	Number Dying from Intemperance. (1)	λ((1)×100)(2) / λ Population. (3)	(2)—(3)	Mortality per Cent.
21 to 30	428	4·6314438 6·1823033	8·4491405	·0281	110	4·0413927 6·2246475	7·8167452	·0066
31 ... 40	646	4·8102325 6·0508853	8·7593472	·0575	99	3·9956352 6·0672482	7·9283870	·0085
41 ... 50	867	4·9380191 5·9149567	9·0230624	·1055	172	4·2355284 5·9306268	8·3049016	·0202
51 ... 60	666	4·8234742 5·7278816	9·0955926	·1246	163	4·2121876 5·7594202	8·4527674	·0284
61 ... 70	435	4·6384893 5·5448725	9·0936168	·1241	107	4·0293838 5·6016033	8·4277805	·0268
71 ... 80	140	4·1461280 5·2290339	8·9170941	·0826	20	3·3010300 5·2996548	8·0013752	·0100
	3,182				671			

Males and Females

Age.	Population, Males. (1) / Population, Females. (2)	Number Lying from Intemperance. (3) / (1) + (2). (4)	λ((3) × 100). (5) / λ Population. (6)	(5) — (6).	Mortality per Cent.
21 to 30	1,521,610 1,677,442	538 3,199.052	4·7307823 6·5050233	8·2257590	·0168
31 ... 40	1,124,308 1,167,477	745 2,291,785	4·8721563 6·3601739	·5119824	·0325
41 ... 50	822,161 852,367	1,039 1,674.528	5·0166155 6·2238925	·7927230	·0620
51 ... 60	534,419 574,672	829 1,109,091	4·9185545 6·0449671	·8735874	·0747
61 ... 70	350,649 399,580	542 750,229	4·7339993 5·8751938	·8588055	·0722
71 ... 80	169,447 199,368	160 368,815	4·2041200 5·5668086	8·6373114	·0434

In the above results, shewing the ratio of deaths as resulting from all intemperate causes, it will be observed that the maximum mortality takes place ten years later in life than in the results given in Table VII, and subsequent Abstract. This difference is due to the reduced ratio of deaths from delirium tremens at ages 51–60, in Abstract B; but,

notwithstanding this, it will be found that the relation of mortality in the male and female population is nearly as 5 to 1;—being as 7259 to 1421.

The following Table exhibits the rate of mortality in the whole population of England and Wales for the year 1847, being the period to which the facts already discussed in regard to intemperance relate. In page 4, *ante* Table B, will be found the rate of mortality for England and Wales for the years 1838–41, and a comparison will shew the increased mortality in the more recent year to be very considerable:—

Table IX.

All Causes—England and Wales, 1847.

Age.	Males.				Females.			
	Number dying from all Causes. (1)	λ((1)×100)(2) / λ Population. (3)	(2) — (3).	Mortality per Cent.	Number dying from all Causes. (1)	λ((1)×100)(2) / λ Population. (3)	(2) — (3).	Mortality per Cent.
21 to 30	15,457	6·1891252 6·1823033	0·0068219	1·016	16,514	6·2178523 6·2246475	9·9932048	·984
31 ... 40	13,459	6·1290128 6·0508853	·0781275	1·197	15,010	6·1763807 6·0672482	0·1091325	1·286
41 ... 50	14,044	6·1474908 5·9149567	·2325341	1·708	13,379	6·1264237 5·9306268	0·1957969	1·570
51 ... 60	14,596	6·1642339 5·7278816	·4363523	2·731	13,666	6·1356414 5·7594202	0·3762212	2·378
61 ... 70	17,923	6·2534107 5·5448725	0·7085382	5·111	18,048	6·2564291 5·6016033	0·6548258	4·517
71 ... 80	19,292	6·2853773 5·2290339	1·0563434	11·385	21,334	6·3290723 5·2996548	1·0294175	10·701
	94,771				97,951			

The following Abstract gives the relation of the rate of mortality from intemperance to that from all causes for different terms of life:—

Age.	Mortality per Cent. from				Ratio of the Deaths from Intemperance to those from all causes.			
	All Causes, 1847.		Intemperance.		Males.		Females.	
	Males.	Females.	Males.	Females.	Per Cent.	or 1 in	Per Cent.	or 1 in
21 ... 30	1·016	·984	·0281	·0066	2·8	36	·7	149
31 ... 40	1·197	1·286	·0575	·0085	4·8	21	·7	151
41 ... 50	1·708	1·570	·1055	·0202	6·2	16	1·3	78
51 ... 60	2·731	2·378	·1246	·0284	4·5	22	1·2	84
61 ... 70	5·111	4·517	·1241	·0268	2·4	41	·6	168
71 ... 80	11·385	10·701	·0826	·0100	·7	138	·09	1,070

From the figures in columns 2 and 6 of Table VIII, it will be seen that, among persons addicted to decidedly intoxicating habits, 3182 males and 671 females die yearly, or 3853 of both sexes. This is strangely at variance with the statements put forth by some of the reformation societies, which make the number to be 50,000 yearly, or

upwards of one in 4 of the whole deaths at the corresponding ages of the deaths from all causes.

As the process is a simple one, it may be interesting before concluding this paper to make an estimate of the persons of each sex in England and Wales who are addicted to such habits of intemperance as will ultimately bring them within the preceding catalogue of deaths. If

δ = the number of deaths yearly taking place from intemperance in the corrected results of the returns of the Registrar-General, as given in Table VIII; and

π = the mortality per cent. among persons of known intemperate habits, as given in Abstract A, page 204;

then $\frac{100\delta}{\pi}$ = the existing number of drunkards, or persons given to extreme drinking usages.

On this principle, the following Table has been constructed:—

TABLE X.

England and Wales, 1847.

Age.	Males. Number of Deaths from Intemperance. (1) / Mortality per Cent. (2)	λ ((1) × 100). (3) / λ (2). (4)	(3) — (4).	Existing Number of Drunkards.	Females. Number of Deaths from Intemperance. (1) / Mortality per Cent. (2)	λ ((1) × 100). (3) / λ (2). (4)	(3) — (4).	Existing Number of Drunkards.	Males and Females. Existing Number of Drunkards.
21 to 30	428	4·6314438	3·9365755	8,641	110	4·0413927	3·3465244	2,221	10,862
	4·953	0·6948683			4·953	0·6948683			
31 ... 40	646	4·8102325	4·1455905	13,983	99	3·9956352	3·3309932	2,143	16,126
	4·620	0·6646420			4·620	0·6646420			
41 ... 50	867	4·9380191	4·1604473	14,469	172	4·2355284	3·4579566	2,870	17,339
	5·992	0·7775718			5·992	0·7775718			
51 ... 60	666	4·8234742	4·0160745	10,377	163	4·2121876	3·4047879	2,540	12,917
	6·418	0·8073997			6·418	0 8073997			
61 ... 70	435	4·6384893	3·7358338	5,443	107	4·0293838	3·1267283	1,339	6,782
	7·992	0·9026555			7·992	0·9026555			
71 ... 80	140	4·1461280	2·8864863	670	20	3·3010300	2·0413883	110	780
	18·182	1·2596417			18·182	1·2596417			
				53,583				11,223	64,806

From which it appears that the number of

drunkards is { Males . . 53,583
Females . 11,223
Total . 64,806

which gives one drunkard to every 74 of the male population,
one ... ... 434 of the female population,
and one ... ... 145 of both sexes above the age of 20.

On the same principle the following gives the ratio of drunkards at each term of life:—

TABLE XI.

Age.	MALES.				FEMALES.			
	Population, 1847.	Drunkards.	Ratio of Drunkards to Population.		Population, 1847.	Drunkards.	Ratio of Drunkards to Population.	
			Per Cent.	or 1 in			Per Cent.	or 1 in
21 to 30	1,521,610	8,641	·57	176	1,677,442	2,221	·13	755
31 ... 40	1,124,308	13,983	1·25	80	1,167,477	2,143	·18	545
41 ... 50	822,161	14,469	1·75	57	852,367	2,870	·34	297
51 ... 60	534,419	10,377	1·92	52	574,672	2,540	·44	226
61 ... 70	350,649	5,443	1·56	64	399,580	1,339	·34	298
71 ... 80	169,447	670	·40	253	199,368	110	·055	1,812

On giving close attention to the principles on which the two preceding Tables are constructed, it must be evident that the figures therein determined simply represent the class of persons in England and Wales who are included in the description given in the concluding paragraph of page 202 *ante*, and the numbers above are therefore not applicable to any other test of what constitutes Intemperance. No doubt there are many persons who will be found to maintain that the number of drunkards must be much greater than has been deduced in the foregoing calculations, but on reflection it will be found impossible for them to do so unless by the adoption of a much more severe test than it was thought proper to adopt for the purpose of this inquiry.

It is hoped that the facts contained in this Contribution may throw some light on a question not hitherto investigated statistically; and that while they point out to assurance offices, and other companies trading in pecuniary adventures on life, the perilous nature of such risks when connected with the lives of intemperate persons, and the urgent necessity for a high rate of premium, they will also not be without valuable influence on the social, political, and religious condition of society.

ANALYTICAL VIEW

OF

RAILWAY ACCIDENTS.

The unusual degree of public attention recently directed to the nature, cause, and extent of railway accidents, has induced me to submit the present paper to the consideration of the public. The vital importance of the railway system to the commercial and social interest of this country, and its rapidly increasing magnitude, threatening to absorb every other means of intercommunication, render an investigation into the causes of accidents in railway traffic, and their effect on the loss of life and limb, one of no ordinary importance.

In order to accomplish as complete an analysis as possible of what will immediately appear to be a very complicated question, there has been embraced in the present inquiry the whole of the information contained in the documents issued by the Railway Department of the Board of Trade, from the 7th of August, 1840, until the most recent return, which brings the results down to the 1st of January, 1853.

Before entering into the inquiry as to the nature of accidents, it will be necessary to understand the extent of railway communication, and the degree to which the public have availed themselves of it.

The following Table shews the number of miles open for traffic at various dates since the month of August, 1840:—

TABLE I.

DATE.	Miles open to Traffic.	Periodical Increase of Railway Communication.
		Miles
August, 1840	1,330	
31st December, 1840	1,556	226 (increase of 5 months).
... 1841	1,717	161 (increase of 1 year).
... 1842	1,857	140 ...
... 1843	1,952	95 ...
... 1844	2,148	196 ...
30th June 1845	2,343	195 (half-yearly).
... 1846	2,765	422 (increase of 1 year).
... 1847	3,603	838 ...
... 1848	4,478	875 ...
... 1849	5,447	969 ...
... 1850	6,308	861 ...
... 1851	6,698	390 ...
... 1852	7,076	378 ...
31st December, 1852	7,336	260 (half-yearly).

From the third column of the above Table, it will be seen that the five years immediately succeeding the 30th of June, 1845, were a period of the greatest activity in the construction of railways, nearly 4000 miles having been opened for traffic in that time, or upwards of one-half of the whole extent of railway communication. The maximum extent of railway opened for traffic in any one year was in 1849; since then much less activity has prevailed, and the number of miles opened has gradually declined every year down to 1852. However satisfactory this activity and energy in developing the railway system may appear, it still contrasts very disadvantageously with the progress of our neighbours in the United States of America. From the seventh census, printed by order of the House of Representatives, it appears that

ABSTRACT A.

	Number of Miles open to Traffic.	Number of Miles in Progress.	Total Miles.
On the 1st of January, 1852	10,843	10,898	21,741
On the 1st of January, 1853	13,266	12,681	25,947
Increase in 1 year	2,423	1,783	4,206

This active spirit of railway extension is not confined to one or two of the States; but appears to be, to a greater or less extent, characteristic of at least twenty-one of them.

The following Table contains a large amount of information on the extent of passenger traffic on the railways of this country; viz:—

(*a.*) The average fare per mile for each class of passengers for each year since the 7th of August, 1840.

(*b.*) The number of passengers of each class who travelled during each year.

(*c.*) And the amount of money received for passenger traffic from each class during each year.

Table II.

Date.	Average Fare per Mile, in Pence.				Number of Passengers.					Receipts in £					
	1st Class.	2nd Class.	3rd Class.	Pary.	1st Class.	2nd Class.	3rd Class.	Parliamentary.	All Classes.*	1st Class.	2nd Class.	3rd Class.	Parliamentary.	All Classes.	
7th August to Dec. 31st, 1840	2·516	1·826	1·297	...	...	...	...	...	6,027,866	...	...	...	...	756,810	
June 30th, 1841	2·516	1·826	1·297	...	1,530,040	4,144,169	2,357,745	...	9,122,816	281,088	231,046	68,515	...	1,145,386	
... 1842	2·503	1·803	1·249	...	2,926,980	7,611,966	5,332,501	...	19,000,000	...	...	...	...	2,970,000	
... 1843	2·490	1·780	1·201	...	4,276,540	11,198,512	6,431,911	...	23,466,896	1,374,942	1,288,758	411,382	...	3,110,257	
Average Fare of the 4 years	2·506	1·809	1·261	...	8,733,560	22,954,647	14,122,157	...	57,617,578					7,982,453	Totals
June 30th, 1844	2·349	1·699	1·145	...	4,875,332	12,235,686	8,583,085	...	27,763,602	1,432,688	1,375,679	483,069	...	3,439,294	
... 1845	2·212	1·588	·968	...	5,474,163	14,325,825	13,135,820	...	33,791,253	1,516,805	1,598,115	651,903	...	3,976,341	
... 1846	2·008	1·465	·953	·926	6,160,354	16,931,065	14,559,515	3,946,922	43,790,984	1,661,898	1,937,947	738,474	293,732	4,725,216	
... 1847	2·046	1·414	·877	·905	6,572,714	18,699,288	15,865,310	6,985,493	51,352,163	1,675,759	2,048,080	737,452	539,977	5,148,002	
Average Fare of the 4 years	2·143	1·529	·987	·916	23,082,563	62,191,864	52,143,730	10,932,415	156,698,002	6,287,150	6,959,821	2,621,898	833,709	17,288,853	Totals.
June 30th, 1848	2·089	1·695	·953	·939	7,190,779	21,690,510	15,241,529	13,092,489	57,965,070	1,792,533	2,352,153	661,038	902,851	5,720,382	
... 1849	2·217	1·614	·982	·952	7,078,690	23,392,450	14,378,376	15,432,457	60,398,159	1,889,646	2,502,588	651,366	1,059,786	6,105,975	
... 1850	2·183	1·584	·951	·933	7,734,728	24,226,668	15,547,749	19,249,974	66,840,175	1,969,247	2,594,817	688,407	1,211,634	6,465,576	
... 1851	2·103	1·531	·929	·913	9,175,781	28,933,044	16,990,073	23,820,723	78,969,623	2,212,799	2,847,469	714,480	1,402,593	7,177,341	
Average Fare of the 4 years	2·149	1·568	·953	·933	31,179,978	98,242,672	62,157,727	71,595,643	264,173,027	7,864,225	10,297,027	2,715,291	4,576,864	25,469,274	Totals.
June 30th, 1852	2·126	1·550	1·023	·905	10,143,442	30,967,913	15,642,137	29,973,553	86,758,997	2,389,971	3,010,921	662,230	1,809,163	7,984,652	
Dec. 31st, 1852	2·035	1·486	·947	·901	5,859,214	17,524,051	9,522,313	16,962,553	49,886,123	1,308,973	1,630,349	440,916	919,986	4,354,831	
									615,133,727					63,080,063	Grand Total.

* All Classes is not the total of the four preceding columns, but includes Mixed Trains, and also Holders of Periodical Tickets.

From the above Table it appears that, in the year ending the 30th June, 1842, the total number of passengers travelling by railways was 19,000,000; but in the year ending the 30th of June, 1852, just ten years after, the number of passengers was no less than 86,758,997, being an increase of about 357 per cent., while, in the same ten years, the number of miles of railway in operation had increased from 1787 miles to 7076 miles, being an increase of nearly 296 per cent., so that the passenger traffic has increased to a much greater extent than the lines of railway communication.

With respect to the revenue from passenger traffic on railways, it is remarkably curious to observe the fluctuations in the receipts from the different classes. The parliamentary trains cannot be considered to have been in proper operation prior to the years 1846–7; and since then the following very striking fluctuations in the passenger traffic of each class manifests itself:—

ABSTRACT B.

In the Year ending the	The Number of Passengers by the			
	First Class.	Second Class.	Third Class.	Parliamentary Class.
30th June, 1847	6,572,714	18,699,288	15,865,310	6,985,493
30th June, 1852	10,143,442	30,967,913	15,642,137	29,973,553
Increase of Traffic per annum in the above five years . .	3,570,728	12,268,625	— 223,173	22,988,060
Or, an Increase in each Class of	54·3 per cent.	65·6 per cent.	— 1·4 per cent.	329·1 per cent.

It thus appears that, while there has been a pretty uniform rate of increase in the first and second classes, of 54·3 per cent. and 65·6 per cent. respectively, there has been actually a slight decrease in the number of passengers travelling by the third class carriages; in fact, it will be seen from the figures in Table II preceding, that ever since the year 1846, the number of passengers travelling by third class carriages has been very uniform, notwithstanding that the line of railway communication has since then increased 156 per cent., the greatest number, in any one year, being 16,990,073, in 1851, and the least being 14,378,376, in 1849; but, viewed in connection with this, will be seen the wonderful increase in the number of persons travelling by the parliamentary trains: ranging from 6,985,493, in 1847, to no less than 29,973,553, in the year 1852, being an augmentation of 329·1 per cent. This very remarkable result in the increase of passengers by the parliamentary trains will be hereafter referred to; but it is now necessary to direct attention to the receipts from each of these classes.

ABSTRACT C.

In the Year ending the	Receipts from the			
	First Class.	Second Class.	Third Class.	Parliamentary Class.
	£	£	£	£
30th June, 1847	1,675,759	2,048,080	737,452	539,977
30th June, 1852	2,389,971	3,010,921	662,230	1,809,163
Increase of Receipts yearly in the above 4 years	714,212	962,841	—75,222	1,269,186
Or, an Increase in each Class of	42·7 per Cent.	47·0 per Cent.	—10·2 per Cent.	235·00 per Cent.

These results follow in somewhat the same order as those deduced in Abstract B, with regard to the number of passengers; but a further abstract of the facts furnished in Table II, is calculated to throw some additional light on the increase of receipts in recent years from the parliamentary trains.

ABSTRACT D.

During the Years	Average Fare per Mile, in Pence.			
	First Class.	Second Class.	Third Class.	Parliamentary Class.
1840—43	2·506	1·809	1·261	
1844	2·349	1·699	1·145	
1845	2·212	1·588	·968	
1846	2·008	1·465	·953	·926
1847	2·046	1·414	·877	·905
1848	2·089	1·695	·953	·939
1849	2·217	1·614	·982	·952
1850	2·183	1·584	·951	·933
1851	2·103	1·531	·929	·913
1852	2·126	1·550	1·023	·905

From this Abstract it will be seen that, in the first and second classes, the minimum rate of fares was charged in the years 1846–7, until which period the scale of charges pretty uniformly and gradually decreased; but since then they have fluctuated at considerably higher prices, and have recently shewn a very decided tendency to increase.

It may be interesting to observe in this place, the difference in the rates of fares charged in different parts of the kingdom. The form of the returns of the railway department do not admit of this being done prior to the year 1850; and the following figures embrace, therefore, only the three years 1850–2:—

Place.	Average Fare per Mile during 1850—52, in Pence.			
	First Class.	Second Class.	Third Class.	Parliamentary Class.
England and Wales .	2·257	1·567	0·983	·916
Scotland	2·022	1·565	1·120	·936
Ireland	1·698	1·298	0·751	·844

These results are calculated to throw some light on this branch of railway management. In Ireland, it will be seen, the fares are for every class less than in either England or Scotland. What is also worthy of remark is, the fact that in Ireland the fares for every class of passengers have, during the above three years, been uniformly decreasing, the rates, in 1852, being about 5 per cent. less in the first, and 8 per cent. less in the parliamentary class than they were in 1850. In Scotland, on the other hand, there has, in the same period, been a decided increase of fares in every class; while in England the fares in the second and third classes only, have increased. If the object of this paper admitted of an extension of this part of the inquiry, it would be important to trace the connection of cheap fares and the fluctuations in the passenger traffic. The scale of fares on the Scotch lines is very peculiar. The first-class fares are intermediate between those for England and Ireland; the second class almost precisely the same as on the English lines, but quite 20 per cent. higher than those on the Irish lines; the third class fares are 14 per cent. above the English, and 49 per cent. above those of the Irish lines; and the parliamentary trains charge fares 2 per cent. above those of the English, and 11 per cent. above those of the Irish railways.

It is, however, in the parliamentary trains that the evident advantages and effects of cheap travelling are to be witnessed. Nothing can be more conclusive on this head than the facts contained in Abstracts B and C; for if any evidence were wanted of the adaptation of the railway system to the locomotive necessities of the population of this country, it is furnished in the magical effects which the cheap and convenient parliamentary trains, stopping at every station, have had on the amount of passenger traffic since the years 1846–7, and the consequent increase of revenue to railway companies. But the introduction of parliamentary trains shews a still more wonderful result on the passenger traffic of recent years, and of a character but very imperfectly understood even by those supposed to be giving attention to railway matters. This interesting feature will be seen in the following table, in which will be found for each year—

(*a.*) The total mileage of each class of passengers, deduced from the data contained in Table II.

(*b.*) The average distance, or number of miles, travelled by passengers in each class; also

(*c.*) The average distance travelled by all classes of passengers taken collectively; and,

(*d.*) Finally, the total distance, or number of miles travelled in the aggregate by the whole of the passengers.

Table III.

Date.	Total Mileage of each Class.				Average Distance Travelled by Passengers in each Class.				Average Distance by each Passenger without distinction of Class.	Total Distance Travelled (or Mileage) by all the Passengers collectively.
	First Class.	Second Class.	Third Class.	Parliamentary.	First Class.	Second Class.	Third Class.	Parliamentary.		
1840	..	..	..	..	..	..	..	..	17·5	105,487,661
1841	26,812,846	30,367,492	12,678,180	..	17·5	7·3	5·4	..	17·5	159,649,280
1842	..	..	..	..	..	..	..	..	17·5	332,500,000
1843	132,524,530	173,765,124	82,207,893	..	30·9	15·1	12·8	..	17·5	410,670,680
Total ...				..	..	..	..	..	..	1,008,307,621
1844	145,459,821	194,327,816	101,254,638	..	29·8	15·9	11·8	..	17·2	477,533,954
1845	119,364,014	241,528,715	161,628,843	..	21·8	16·9	12·3	..	15·9	537,280,923
1846	198,633,227	317,479,372	185,975,614	76,129,244	32·3	18·8	12·1	19·3	18·5	810,133,204
1847	196,667,722	347,623,197	201,811,266	143,198,320	31·4	18·6	12·7	20·5	18·7	960,285,448
Total...	660,134,784	1,100,959,100	650,670,361	219,327,564	28·6	17·7	12·5	20·1	17·7	2,785,233,529
1848	205,939,646	333,048,212	166,473,368	230,760,639	28·6	15·3	10·9	17·6	16·3	944,830,641
1849	204,562,490	372,132,045	159,193,320	267,172,941	28·9	15·9	11·1	17·3	16·6	1,002,609,439
1850	216,499,899	393,154,091	173,730,473	311,674,341	28·0	16·2	11·2	16·2	16·4	1,096,178,870
1851	252,530,552	446,370,059	184,580,409	368,699,146	27·5	15·4	10·9	15·5	15·9	1,255,617,005
Total...	879,533,587	1,544,704,407	683,977,570	1,178,307,067	28·2	15·7	11·0	16·4	16·3	4,259,235,955
1852	269,799,172	466,207,123	155,361,877	479,778,033	26·6	15·1	10·0	16·0	15·8	1,370,792,153

This Table shews that the average distance travelled by the passengers of each class is yearly becoming less and less. This is observable in a remarkable degree in the second, third, and the parliamentary classes; and also to some extent in the first class. The following Abstract gives a succinct view of these facts:—

ABSTRACT E.

During the Years	Average Distance in Miles travelled by Passengers in the				
	First Class.	Second Class.	Third Class.	Parliamentary Class.	All Classes.
1844 to 47	28·6	17·7	12·5	20·1	17·7
1848 ... 51	28·2	15·7	11·0	16·4	16·3
1852	26·6	15·1	10·0	16·0	15·8

The figures given in this Abstract disclose the remarkable feature connected with the introduction of cheap fares, and which, at first sight, may appear anomalous, viz., that of passengers by the parliamentary trains, travelling greater distances than those by either the second or third class carriages. An examination, however, of the facts given in Table II, with regard to third class passengers, will help to throw some light on this result. It will be there seen that, ever since the year 1846, little or no change has taken place in the amount of the third class traffic; in fact, the obviously absurd plan in use in this country, of having four classes or grades of passengers, has had the effect of almost neutralizing the third class and substituting the parliamentary; but this is evidently not the only effect which the cheap parliamentary fares have had on the character of the passenger traffic. The upper and middle classes, for whom the first and second class modes of conveyance are more particularly designed, are so circumstanced in their travelling excursions, as to be called on to go greater distances than those to whom the lower fares are a necessity. The avocations, business arrangements, and social relations of the wealthy and the middle classes are generally such as to involve the necessity of travelling to greater distances, and hence we should naturally expect the lessening average distance of each journey as shewn in Abstract E, with respect to the first, second, and third classes; but whence the amount of the increased distances travelled by the parliamentary class beyond that by either the second or third class? It will be found in the circumstance of the immense disparity between the fares of the paliamentary trains and those of the first and second class, which induces a large number of persons, going distant journies, to economise their expenses by the great saving in the prices of parliamentary trains. And this explanation will be fully understood by any one making a careful examination of the ninth column of Table II, and also the fifth column of Table III, in which it will be found, that during the year 1852 the traffic of the parliamentary class had so rapidly and so greatly increased, that

The total Mileage exceeded that of the Third Class by 324,416,156 miles.
The total Mileage exceeded that of the First Class by 209,978,861 ...
The total Mileage exceeded that of the First and Third Classes united by . . . . . 54,616,984 ...
And even exceeded the total Mileage of the Second Class by . . . . . 13,570,910 ...

Nothing more is needed to shew the growing importance of cheap fares, and whence arises the unexpected result of the prolonged average journeys in the parliamentary classes beyond all the other classes except the first. It might almost be affirmed, from an inspection of column 5, Table II, and the last column of Abstract D, that even railway directors are themselves beginning to understand the importance of parliamentary trains and cheap fares; for while the fares of every other class shew a very decided tendency to increase, the scale of the parliamentary class has been gradually lowering ever since the year 1849; and the legitimate consequence of this decrease in the rate of charge has been an increase of the revenue of that class, both absolutely, and relatively to the receipts from the whole passenger traffic.

Abstract F.

During the Years ending	Amount of Revenue from		
	All Classes.	Parliamentary Classes.	Ratio of Receipts in Parliamentary Class to all Classes.
	£	£	
30th June, 1849 . .	6,105,975	1,059,786	17·3 per cent.
30th June, 1852 . .	7,984,652	1,809,163	22·7 per cent.
Increase . .	1,878,677	749,377	

It thus appears, that no less than 22·7 per cent. of the whole revenue from passenger traffic arises from parliamentary fares.

Apart from their financial interest and value, some of the conclusions arising directly out of the preceding Tables and Abstracts are of immediate importance in questions hereafter arising in this paper.

1st. The fact that, while since the year 1842 the extent of railway communication has increased 296 per cent., the number of passengers has increased at the higher ratio of 357 per cent.

2nd. Although the total mileage has increased from 332,500,000 miles to no less than 1,370,792,153 miles per annum in the same period, still the average distance travelled by each passenger, taking all classes collectively, has decreased from 17·5 miles to 15·8 miles each journey; and,

3rd. Consequently, this modification in the traffic of passengers must be attended with an increased number of arrivals and departures from the various railway stations, relatively to the whole amount of passenger traffic; a

circumstance which will be found to have an important bearing on some of the results to be hereafter discussed.

Much has of late been written on the causes of railway accidents, and an endless variety of suggestions have been offered for their prevention for the future; but, almost without a single exception, the whole of what has been written, and all the remedies proposed, appear to have originated from observations on isolated, or at all events on a very partial number of cases, and nothing like a fair attempt has been made to analyse the whole of the accidents, so as to shew the numerical frequency of each kind, or its tendency to occasion loss of life or limb. Some, while urging the necessity of improvement in the use and management of signals, will be found to assume that nearly all the accidents are due to causes which the suggested improvements would remove. Others again, while adopting the same view to a greater or less extent, take for granted that the bulk of all the accidents assume the form of collisions, and not contenting themselves with the simple aid of the telegraph and other station signals, bring before the public new forms of breaks and other kindred appliances, calculated to stop, in a speedy manner, trains while in motion. These and many other modes of looking at railway accidents, may, and very likely will, lead to improvements; but still it will be found that the majority of accidents would be left untouched, and a great deal would remain to be done before anything like a considerable reduction in them is effected. From looking at so important a subject from such partial points of view, very little benefit is to be hoped; and under this conviction it has been thought necessary, prior to entering on the consideration of remedies, to ascertain, as correctly as possible, the true nature, extent, and causes of the various kinds of accidents.

A little reflection will suffice to shew that all railway accidents may be so classified as to exhibit them—

1st. In relation to causes directly connected with the state and condition of the road and permanent way; and,

2nd. As connected with the construction and management of the rolling stock, namely, engines, carriages, trucks, &c. And this last branch of the classification is susceptible of many subdivisions; for even assuming that the permanent way, locomotive machinery, and appliances, were perfect in construction and durability, a large class of accidents will be found to take place from causes involving the considerations of skill in the management of the various details of a railway and the working of trains and signals.

In the following analysis of the accidents, an attempt has been made to effect such a classification of them as would shew to what extent they were due to causes beyond the control of the respective companies; and also exhibit in what degree they were due to causes falling within the control or management of the companies.

By this mode of inquiry, results, it is hoped, will be arrived at to enable the

public either to judge how far the frequently occurring accidents are susceptible of diminution, by the exercise of greater vigilance on the part of the railway staff and the employment of greater intelligence, or, by bringing into more prominent view the defects in the construction and maintenance of the permanent way and the machinery, to suggest improvements.

In such an analysis, considerable care is needed as to the precise form or kind of cause under which the accidents should be arranged; for it is evident that the same general kind of accident might be repeated over and over again, but in a slightly modified form in regard to some of its details, thus rendering it quite possible to make many subdivisions in the general class or cause. It must, however, be obvious that subdivisions of this kind might be carried so far as to deprive the results of any practical value: unless each embraced a sufficient group of facts from which to draw conclusions, not only as to the characteristic results of that particular class of accidents, but also as to the permanency of the connecting circumstances usually giving birth to them, no importance could be attached to such minute subdivisions. In order to avoid the evils which would result from any attempt to deduce general principles from observations on a distinctive group of accidents of small numerical value in itself, several such groups have in many cases been combined, having one or more points of common agreement. Keeping considerations of this kind closely in view, and never losing sight of the urgent necessity, that the results to be arrived at should have a strictly practical bearing and application, the analysis made has recognised twelve principal causes or rather conditions under which accidents have taken place, six of which are assignable to circumstances over which the companies have no direct or certain control; the other six embracing causes which fall directly under the control of the companies, through their officers and servants.

Having thus decided on a mode of inquiry which was deemed calculated to exhibit with sufficient precision for practical purposes the causes of the various accidents, it next appeared important to adopt a separate and distinct classification of them as they affected passengers, as they affected the public not passengers for the time being, and as they affected the officers and different servants of railway companies.

As it was also of importance to determine the variations, if any, at different periods in the frequency of railway accidents from different causes, the results will be found given for each year, for each cause, and for each class of persons.

In the following eight Tables will be found a detailed record of the number of persons killed, and of the number injured, in each year since 1840, from each of twelve different causes.

Table IV has reference to passengers only.

Table V has reference to the public not passengers, very often the friends of passengers accompanying them to the station, or meeting them on arrival.

Table VI has reference to trespassers on the lines.

Tables VII—XI inclusive, relate to the employés of the companies.

TABLE IV.—*Number of Deaths and Injuries from various causes among*

PASSENGERS.

CAUSE.	Reference No.	1840.		1841.		1842.		1843.		1844.		1845.		1846.		1847.		1848.		1849.		1850.		1851.		1852.		Total.	
		Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Collision	1	4	13	3	35	..	6	..	..	5	55	3	28	1	11	2	10	..	28	..	16	2	29	6	148	3	117	29	496
Off line	2	9	27	5	7	..	5	..	..	..	3	..	12	..	17	5	18	2	12	5	18	..	18	9	48	..	17	35	202
Running into station	3	1	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	8	..	1	4	33	5	54
Axle breaking (*d*)	4	2	10	2	..	1	3	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	6	15
Machinery ditto (*e*)	5	..	4	..	1	..	..	..	..	..	..	..	..	..	1	2	2	..	..	..	6	..	7	..	10	..	..	2	31
Falling from train (*c*)	6	2	2	2	3	..	2	..	1	1	1	2	..	1	..	1	1	1	2	2	..	2	2	2	2	..	..	16	16
Jumping from ditto (*b*)	7	..	5	2	8	..	8	1	5	2	4	2	3	5	9	5	7	2	3	1	3	8	1	4	4	2	4	34	64
Run over (*f*)	8	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	3	1	5	..	4	1	4	..	4	..	22	2
Collision at station	9	4	68	1	13	..	..	1	1	..	6	1	42	3	74	7	32	7	81	..	43	6	97	3	146	2	204	35	807
Mounting train in motion (*a*)	10	..	1	1	2	2	2	2	2	1	1	2	2	2	4	3	1	3	1	5	6	3	8	5	10	10	3	39	43
Crushed	11	2	5	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	5	5
Miscellaneous	12	..	..	9	14	2	..	2	..	..	..	..	..	5	3	3	22	2	2	5	4	3	10	2	4	5	2	38	61
Total	..	24	142	26	83	5	26	6	9	10	70	10	87	17	120	31	93	20	135	23	96	28	181	36	373	30	381	266	1796

TABLE V.—*Number of Deaths and Injuries from various causes among*

PUBLIC BY THEIR OWN NEGLIGENCE.

CAUSE.	Reference No.	1840.		1841.		1842.		1843.		1844.		1845.		1846.		1847.		1848.		1849.		1850.		1851.		1852.		Total.	
		Killed.	Injured	Killed.	Injured.	Killed.	Injured	Killed.	Injured	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Collision	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Off line	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Running into station	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Axle breaking	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Machinery ditto	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Falling from train	6	..	1	..	1	..	1	..	..	2	1	1	2	1	..	2	..	..	..	..	..	..	..	..	..	..	..	6	6
Jumping from ditto	7	..	..	..	..	..	..	..	..	..	1	1	..	1	..	2	..	..	..	..	..	..	..	..	..	..	..	4	1
Run over	8	4	1	7	5	8	1	10	3	12	3	5	4	12	6	15	3	6	1	9	..	16	..	16	..	13	2	133	29
Collision at station	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mounting train in motion	10	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	..	3	1
Crushed	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	1	..	1	..	1	1	4	2
Miscellaneous	12	..	..	..	..	..	..	..	1	1	4	1	2	1	1	1	2	2	1	1	4	4	1	6	5	8	5	25	26
Total	..	4	2	7	6	8	2	10	4	16	9	8	8	15	7	21	5	8	2	10	5	21	2	23	5	24	8	175	65

TABLE VI.—*Number of Deaths and Injuries from various causes among* TRESPASSERS.

CAUSE.	Reference No.	1840.		1841.		1842.		1843.		1844.		1845.		1846.		1847.		1848.		1849.		1850.		1851		1852.		Total.	
		Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured	Killed.	Injured.
Collision	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	.	..	..	..	..	..	..	1
Off line	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Running into station	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Axle breaking	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Machinery ditto	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..
Falling from train	6	..	2	1	..	4	3	..	1	1	2	..	..	1	..	..	1	..	..	..	..	..	1	1	..	..	..	8	10
Jumping from ditto	7	..	..	..	..	..	..	..	1	..	2	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	1	4
Run over	8	2	..	6	5	13	5	10	5	5	..	22	3	16	1	37	8	31	4	34	..	26	3	30	7	36	4	268	45
Collision at station	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mounting train in motion	10	..	..	..	..	..	..	..	..	..	..	2	1	1	..	..	..	3	1	1	1	1	..	..	..	2	..	10	3
Crushed	11	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	2	..	2	..	2	..	1	1	9	1
Miscellaneous	12	..	..	..	..	..	..	2	..	..	..	..	..	..	1	..	..	..	3	..	5	2	5	5	3	..	3	9	20
Total	..	3	2	7	5	17	8	12	7	7	4	24	4	18	2	37	9	36	8	37	7	31	10	39	10	39	8	306	84

TABLE VII.—*Number of Deaths and Injuries from various causes among* ENGINE DRIVERS.

CAUSE.	Reference No.	1840.		1841.		1842.		1843.		1844.		1845.		1846.		1847.		1848.		1849.		1850.		1851.		1852.		Total.	
		Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Collision	1	..	4	..	..	..	..	..	..	2	..	..	2	1	2	1	1	1	..	1	2	..	1	..	..	..	1	6	13
Off line	2	..	..	..	..	..	..	..	..	2	1	2	1	3	2	4	3	2	5	2	..	..	2	1	2	3	5	19	21
Running into station	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Axle breaking	4	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Machinery ditto	5	..	..	..	..	..	..	1	..	..	2	..	1	..	1	..	..	1	1	..	2	2	3	2	1	1	..	7	11
Falling from train	6	..	2	1	..	1	1	1	3	1	1	..	..	2	2	..	1	..	..	..	..	..	..	3	..	1	2	10	12
Jumping from ditto	7	..	..	..	..	..	..	..	..	..	..	..	1	1	1	1	..	..	1	..	..	..	..	..	..	1	..	3	3
Run over	8	..	..	..	2	1	2	..	..	..	..	..	..	..	..	3	1	..	..	..	..	..	..	..	..	..	..	4	5
Collision at station	9	..	..	..	..	..	..	..	..	..	..	1	..	..	5	1	..	..	3	..	..	1	3	..	1	3	2	6	14
Mounting train in motion	10	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	1	..	4	1
Crushed	11	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	1	..	2	..	..	2	..	..	..	3	4
Miscellaneous	12	..	..	..	2	..	..	..	1	2	1	..	..	..	..	1	..	..	..	3	2	1	2	2	1	1	..	10	9
Total	..	1	6	1	4	2	4	3	4	7	6	3	5	7	14	11	6	6	11	6	8	4	11	11	5	11	10	73	94

TABLE VIII.—*Number of Deaths and Injuries from various causes among*

STOKERS.

CAUSE.	Reference No.	1840.		1841.		1842.		1843.		1844.		1845.		1846.		1847.		1848.		1849.		1850.		1851.		1852.		Total.	
		Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Collision	1	..	..	..	..	1	1	..	..	..	2	1	1	..	1	1	1	..	2	1	..	1	..	1	..	2	1	8	9
Off line	2	..	..	..	..	..	..	..	..	1	1	1	1	1	2	1	4	1	3	2	..	..	1	2	1	4	3	13	16
Running into station	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1
Axle breaking	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Machinery breaking	5	..	..	..	..	.	..	..	..	1	2	..	1	1	1	1	2	2	1	3	.	2	1	..	1	1	1	11	10
Falling from train	6	..	..	..	2	1	2	1	4	2	3	2	2	..	..	7	4	4	..	3	4	5	1	2	1	1	3	28	26
Jumping from ditto	7	..	..	..	..	..	1	..	..	..	..	1	..	1	..	1	..	1	1	..	..	1	..	..	1	..	1	5	4
Run over	8	1	..	..	1	2	1	..	..	..	..	1	..	..	1	2	1	2	1	..	..	2	..	..	..	1	..	11	5
Collision at Station	9	..	..	..	..	..	..	..	..	..	..	..	2	..	4	2	2	..	2	1	..	1	2	..	2	1	4	5	18
Mounting train in motion	10	..	..	..	..	..	..	1	..	..	..	..	1	..	..	1	..	..	..	2	1	..	..	..	..	3	1	7	3
Crushed	11	..	5	..	..	..	..	..	..	..	2	..	..	3	1	2	1	4	3	..	..	..	2	1	1	3	2	13	17
Miscellaneous	12	..	..	..	1	..	..	..	1	2	2	1	..	1	1	4	2	..	1	1	2	4	..	..	3	2	1	15	14
Total	..	1	5	..	4	4	5	2	5	6	12	7	8	7	11	22	17	14	14	13	7	16	8	6	10	18	17	116	123

TABLE IX.—*Number of Deaths and Injuries from various causes among*

GUARDS.

CAUSE.	Reference No.	1840.		1841.		1842.		1843.		1844.		1845.		1846.		1847.		1848.		1849.		1850.		1851.		1852.		Total.	
		Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Collision	1	..	..	..	..	..	..	..	..	..	1	..	1	..	..	2	1	..	3	..	..	1	..	..	..	..	2	3	8
Off line	2	..	..	..	..	..	..	..	..	..	..	..	2	..	3	1	1	2	1	..	..	..	..	..	1	3	3	6	11
Running into station	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1
Axle breaking	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Machinery ditto	5	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	2	..	1	1	1	..	..	..	..	1	6
Falling from train	6	..	1	..	2	1	1	4	4	1	..	4	2	4	1	2	2	4	1	6	4	8	..	2	..	1	2	37	17
Jumping from ditto	7	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	2	..
Run over	8	..	..	..	1	1	..	..	..	..	..	1	..	2	..	..	1	2	..	1	..	3	1	2	..	1	1	13	4
Collision at station	9	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	2	..	1	1	..	..	4	2	..	..	..	4	8
Mounting train in motion	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	4	..	2	1	2	2	1	..	..	..	10	3
Crushed	11	..	..	..	2	1	..	..	..	..	..	..	..	1	1	1	2	1	..	1	4	3	1	5	..	1	2	14	12
Miscellaneous	12	.	1	1	..	3	1	1	1	4	4	1	2	1	2	3	..	8	2	4	4	3	5	2	2	6	6	37	30
Total	..	..	2	1	5	7	2	5	2	5	6	6	7	9	9	10	9	22	10	15	14	21	15	14	3	12	16	127	100

TABLE X.—*Number of Deaths and Injuries from various causes among* PORTERS.

CAUSE.	Reference No.	1840.		1841.		1842.		1843.		1844.		1845.		1846.		1847.		1848.		1849.		1850.		1851.		1852.		Total.	
		Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Collision	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Off line	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	1	1	2
Running into station	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Axle breaking	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Machinery	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Falling from train	6	1	..	1	1	1	1	..	..	..	..	1	..	..	..	3	..	..	..	1	1	1	..	..	2	1	..	10	5
Jumping from ditto	7	..	..	1	..	..	..	..	..	1	..	1	..	1	..	..	..	..	..	1	..	..	1	..	..	1	1	6	2
Run over	8	..	..	1	1	1	..	..	..	..	3	1	1	1	..	5	1	3	..	6	..	4	..	3	..	6	1	31	7
Collision at station	9	..	..	..	1	..	..	..	.	..	..	1	..	1	4	..	..	..	..	..	..	..	..	1	1	1	1	4	7
Mounting train in motion	10	..	..	..	..	..	1	2	..	..	..	..	..	..	..	1	..	3	1	..	..	..	..	1	1	2	0	9	3
Crushed	11	..	..	..	..	1	..	5	3	2	..	1	1	4	1	3	1	4	4	4	3	2	1	8	2	7	2	41	18
Miscellaneous	12	..	..	1	..	..	..	1	1	3	1	1	..	..	1	..	2	..	1	1	4	2	3	5	5	1	3	15	21
Total	..	1	..	4	3	3	2	8	4	6	4	6	2	7	7	12	4	10	6	13	8	9	5	19	11	19	9	117	65

TABLE XI.—*Number of Deaths and Injuries from various causes among* OTHER SERVANTS.

CAUSE.	Reference No.	1840.		1841.		1842.		1843.		1844.		1845.		1846.		1847.		1848.		1849.		1850.		1851.		1852.		Total.	
		Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured	Killed.	Injured	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Collision	1	..	..	..	..	..	2	..	1	..	5	1	1	1	10	..	..	1	10	1	3	1	..	1	..	5	2	11	34
Off line	2	..	..	..	1	..	..	..	..	1	1	2	9	..	2	2	4	..	..	..	..	..	..	1	..	..	..	6	17
Running into station	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Axle breaking	4	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	2	..	..	..	4	1
Machinery ditto	5	..	..	..	..	..	..	..	..	..	..	3	..	1	3	..	..	..	3	..	1	1	1	..	1	..	1	5	10
Falling from train	6	..	2	1	1	3	3	5	2	4	3	5	2	2	1	6	2	10	1	3	5	5	3	8	1	4	5	56	31
Jumping from ditto	7	1	1	2	2	2	1	1	..	3	1	1	1	2	3	5	4	1	3	2	1	3	1	1	2	..	1	24	21
Run over	8	9	2	19	11	17	11	11	4	16	1	19	5	42	8	38	14	45	4	41	1	39	..	25	3	32	6	353	70
Collision at station	9	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	1	5	1	..	..	..	1	2	..	..	6	8	10
Mounting train in motion	10	..	..	..	..	1	2	..	2	..	1	3	2	6	2	4	..	6	3	6	5	3	2	3	4	3		35	23
Crushed	11	2	3	..	3	3	2	4	2	..	1	1	2	3	2	8	1	14	5	9	8	13	1	9	4	6	..	72	34
Miscellaneous	12	..	..	1	..	1	1	..	2	3	4	1	1	4	2	2	5	4	3	20	17	14	13	11	6	13	16	74	70
Total	..	12	8	23	18	27	22	21	13	28	17	36	23	61	35	67	31	86	33	82	41	79	22	63	21	63	37	648	321

The following is a condensed summary of the results of the preceding eight Tables:—

ABSTRACT G.

Deaths and Injuries amongst Different Classes, from all Causes, from the 7th August, 1840, to the 31st December, 1852.

CLASS.	Killed.	Injured.	Ratio of Injured to Killed.
Passengers	266	1,796	675·20 per cent.
Public, by their own negligence	175	65	37·14 ...
Trespassers	306	84	27·45 ...
Engine Drivers	73	94	128·77 ...
Stokers	116	123	106·04 ...
Guards	127	100	78·74 ...
Porters	117	65	55·56 ...
Other Servants	648	321	49·54 ...
Total	1,828	2,648	144·86 per cent.

The last column of this Abstract shews in one respect a most remarkable difference in the way in which the accidents affect passengers and the servants of the companies. The number injured amongst passengers being in the ratio of 675·20 per cent. to that of the killed; but amongst railway servants, the number of injuries falls short of the number of deaths, the ratio of injuries being almost exactly 65 per cent. of the deaths. The cause of this distinction will hereafter appear.

On referring to Table II preceding, it will be found, that within the period to which the facts of the preceding Abstracts relate, the total number of passengers amounted to 615,133,727. And, consequently $\frac{615,133,727}{266}$, or one in every 2,312,533 passengers has been killed since the 7th of August, 1840.

And in like manner $\frac{615,133,727}{1,796}$, or one in every 342,502 passengers has sustained serious bodily injury in the same time. So that, if the causes which have hitherto prevailed in producing railway accidents should remain constant, the preceding ratios would measure the risk of life and limb in railway travelling.

The following Table gives the result of Tables IV to XI, in a more condensed form by omitting the causes of the accidents.

Table XII.

Total Number of Persons Killed and Injured on Railways.

Class.	1840.		1841.		1842.		1843.		1844.		1845.		1846.		1847.		1848.		1849.		1850.		1851.		1852.		Total.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Passengers . . .	24	142	26	83	5	26	6	9	10	70	10	87	17	120	31	93	20	135	23	96	28	181	36	373	30	381	266	1,796
Public by their own Negligence	4	2	7	6	8	2	10	4	16	9	8	8	15	7	21	5	8	2	10	5	21	2	23	5	24	8	175	65
Trespassers . .	3	2	7	5	17	8	12	7	6	4	24	4	18	2	37	9	36	8	37	7	31	10	39	10	39	8	306	84
Engine Drivers .	1	6	1	4	2	4	3	4	7	6	3	5	7	14	11	6	6	11	6	8	4	11	11	5	11	10	73	94
Stokers	1	5	..	4	4	5	2	5	6	12	7	8	7	11	22	17	14	14	13	7	16	8	6	10	18	17	116	123
Guards	..	2	1	5	7	2	5	2	5	6	6	7	9	9	10	9	22	10	15	14	21	15	14	3	12	16	127	100
Porters	1	..	4	3	3	2	8	4	6	4	6	2	7	7	12	4	10	6	13	8	9	5	19	11	19	9	117	65
Other Servants .	12	8	23	18	27	22	21	13	28	17	36	23	61	35	67	31	86	33	82	41	79	22	63	21	63	37	648	321
Total . .	46	167	69	128	73	71	67	48	84	128	100	144	141	205	211	174	202	219	199	186	209	254	211	438	216	486	1,828	2,648

The following condensed summary of this Table, so far as passengers are affected, shews, in a very satisfactory way, the gradual diminution of railway accidents.

ABSTRACT H.

PERIOD.	Passengers.			Ratios.	
	Number.	Killed.	Injured.	One killed in	One injured in
1840–43	57,617,578	61	260	944,550	221,606
1844–47	156,698,002	68	370	2,304,382	423,508
1848–51	264,173,027	107	785	2,468,907	336,526
1852	86,758,997	30	381	2,891,966	227,714

It thus appears that, while in the years 1840–43, there was 1 killed in every 944,550 passengers, there was, in the years 1848–51, only 1 in every 2,468,907 passengers, being not one death for two which happened in the earlier period.

So also will a reduction be found to have taken place in the ratio of passengers injured.

In like manner will Table XII furnish the means by which to determine the relative number of railway servants killed and injured in the same periods; but it is proposed, in the first place, to keep to that part of the inquiry which affects the passengers only. This, although really the least important branch of the subject, so far as loss of life is concerned, is, nevertheless, that in which the general public is most interested; and, as the daily and periodical press have recently taken up the matter so warmly, as complete an analysis of it will be given in this paper as the available facts and data will admit of being accomplished. In order to carry out this view, the whole of the materials have been re-arranged in the following eight Tables, from which a very distinct and complete knowledge of the intensity of each cause in producing accidents among all the classes of persons observed upon, in each year, and throughout the whole period, may be obtained.

It will be seen from Tables XIV and XV, that the number of deaths from railway accidents among the public, not being either passengers or employés, is much greater than amongst passengers merely.

The number of passengers killed, according to Table XIII, is 266.

The number killed of the public (neither passengers nor employés), by their own negligence, and of trespassers, is 481.

But the consideration of the last group of deaths will be likewise reserved for discussion in the latter part of this communication.

Table XIII.

Number of Deaths and Injuries from various causes among

Passengers.

Years.	Collision.		Off Line.		Running into Station.		(*d*) Axle Breaking.		(*e*) Machinery Breaking.		(*c*) Falling from Train.		(*b*) Jumping from Train.		(*f*) Run over.		Collision at Station.		(*a*) Mounting Train in motion.		Crushed.		Miscellaneous.		Years.	Total.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.		Killed.	Injured.
1840	4	13	9	27	1	7	2	10	..	4	2	2	..	5	..	..	4	68	..	1	2	5	..	..	1840	24	142
1841	3	35	5	7	..	..	2	..	..	1	2	3	2	8	1	..	1	13	1	2	..	..	9	14	1841	26	83
1842	..	6	..	5	..	..	1	3	..	..	..	2	..	8	..	..	..	..	2	2	..	..	2	..	1842	5	26
1843	..	..	..	..	..	..	..	..	..	..	..	1	1	5	..	..	1	1	2	2	..	..	2	..	1843	6	9
	7	54	14	39	1	7	5	13	..	5	4	8	3	26	1	..	6	82	5	7	2	5	13	14		61	260
1844	5	55	..	3	..	..	1	..	..	..	1	1	2	4	..	..	..	6	1	1	..	..	..	..	1844	10	70
1845	3	28	..	12	..	..	..	..	..	..	2	..	2	3	..	..	1	42	2	2	..	..	..	..	1845	10	87
1846	1	11	..	17	..	..	..	1	..	1	1	..	5	9	..	..	3	74	2	4	..	..	5	3	1846	17	120
1847	2	10	5	18	..	..	..	..	2	2	1	1	5	7	1	..	7	32	3	1	2	..	3	22	1847	31	93
	11	104	5	50	..	..	1	1	2	3	5	2	14	23	1	..	11	154	8	8	2	..	8	25		68	370
1848	..	28	2	12	..	5	..	..	..	..	1	2	2	3	3	1	7	81	3	1	..	..	2	2	1848	20	135
1849	..	16	5	18	..	..	..	..	..	6	2	..	1	3	5	..	..	43	5	6	..	..	5	4	1849	23	96
1850	2	29	..	18	..	8	..	..	..	7	2	2	8	1	4	1	6	97	3	8	..	..	3	10	1850	28	181
1851	6	148	9	48	..	1	..	..	..	10	2	2	4	4	4	..	3	146	5	10	1	..	2	4	1851	36	373
	8	221	16	96	..	14	..	..	..	23	7	6	15	11	16	2	16	367	16	25	1	..	12	20		107	785
1852	3	117	..	17	4	33	..	1	..	..	..	..	2	4	4	..	2	204	10	3	..	..	5	2	1852	30	381
Totals..	29	496	35	202	5	54	6	15	2	31	16	16	34	64	22	2	35	807	39	43	5	5	38	61	Grand Total	266	1,796

Table XIV.

Number of Deaths and Injuries from various causes among

Public by their own Negligence.

Years.	Collision.		Off Line.		Running into Station.		Axle Breaking.		Machinery Breaking.		Falling from Train.		Jumping from Train.		Run Over.		Collision at Station.		Mounting Train in Motion.		Crushed.		Miscellaneous.		Years.	Total.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.		Killed.	Injured.
1840	..	..	..	..	..	..	..	..	..	..	..	1	..	..	4	1	..	..	..	..	..	..	..	..	1840	4	2
1841	..	..	..	..	..	..	..	..	..	..	..	1	..	..	7	5	..	..	..	..	..	..	..	..	1841	7	6
1842	..	..	..	..	..	..	..	..	..	..	..	1	..	..	8	1	..	..	..	..	..	..	..	..	1842	8	2
1843	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	3	..	..	..	..	..	..	..	1	1843	10	4
	..	..	..	..	..	..	..	..	..	..	..	3	..	..	29	10	..	..	..	..	..	..	..	1		29	14
1844	..	..	..	..	..	..	..	..	..	..	2	1	..	1	12	3	..	..	1	..	..	..	1	4	1844	16	9
1845	..	..	..	..	..	..	..	..	..	..	1	2	1	..	5	4	..	..	..	..	..	..	1	2	1845	8	8
1846	..	..	..	..	..	..	..	..	..	..	1	..	1	..	12	6	..	..	..	..	..	..	1	1	1846	15	7
1847	..	..	..	..	..	..	..	..	..	..	2	..	2	..	15	3	..	..	..	..	1	..	1	2	1847	21	5
	..	..	..	..	..	..	..	..	..	..	6	3	4	1	44	16	..	..	1	..	1	..	4	9		60	29
1848	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	1	..	..	..	..	..	..	2	1	1848	8	2
1849	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	..	..	..	..	..	..	1	1	4	1849	10	5
1850	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16	..	..	..	..	1	1	..	4	1	1850	21	2
1851	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16	..	..	..	..	..	1	..	6	5	1851	23	5
	..	..	..	..	..	..	..	..	..	..	..	..	..	..	47	1	..	..	..	1	2	1	13	11		62	14
1852	..	..	.	..	..	..	..	..	..	..	..	..	..	..	13	2	..	..	2	..	1	1	8	5	1852	24	8
Totals	..	..	..	..	..	..	..	..	..	..	6	6	4	1	133	29	..	..	3	1	4	2	25	26	Grand Total	175	65

Table XV.

Number of Deaths and Injuries from various causes among

Trespassers.

Years.	Collision.		Off Line.		Running into Station.		Axle Breaking.		Machinery Breaking.		Falling from Train.		Jumping from Train.		Run Over.		Collision at Station.		Mounting Train in Motion.		Crushed.		Miscellaneous.		Years.	Total.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.		Killed.	Injured.
1840	..	..	..	..	..	..	..	..	..	..	..	2	..	..	2	..	..	..	..	..	1	..	..	..	1840	3	2
1841	..	..	..	..	..	..	..	..	..	..	1	..	..	..	6	5	..	..	..	..	..	..	..	..	1841	7	5
1842	..	..	..	..	..	..	..	..	..	..	4	3	..	..	13	5	..	..	..	..	..	..	..	..	1842	17	8
1843	..	..	..	..	..	..	..	..	..	..	..	1	..	1	10	5	..	..	..	..	..	..	2	..	1843	12	7
	..	..	..	..	..	..	..	..	..	..	5	6	..	1	31	15	..	..	..	..	1	..	2	..		39	22
1844	..	..	..	..	..	..	..	..	..	..	1	2	..	2	5	..	..	..	..	..	..	..	..	..	1844	6	4
1845	..	..	..	..	..	..	..	..	..	..	..	..	..	..	22	3	..	..	2	1	..	..	..	..	1845	24	4
1846	..	..	..	..	..	..	..	..	..	..	1	..	..	..	16	1	..	..	1	..	..	..	..	1	1846	18	2
1847	..	..	..	..	..	..	..	..	..	..	..	1	..	..	37	8	..	..	..	..	..	..	..	..	1847	37	9
	..	..	..	..	..	..	..	..	..	..	2	3	..	2	80	12	..	..	3	1	..	..	..	1		85	19
1848	..	..	..	..	..	..	..	..	..	..	..	..	1	..	31	4	..	..	3	1	1	..	..	3	1848	36	8
1849	..	1	..	..	..	..	..	..	..	..	..	..	..	..	34	..	..	..	1	1	2	..	..	5	1849	37	7
1850	..	..	..	..	..	..	..	..	..	..	..	1	..	1	26	3	..	..	1	..	2	..	2	5	1850	31	10
1851	..	..	..	..	..	..	..	..	1	..	1	..	..	..	30	7	..	..	..	..	2	..	5	3	1851	39	10
	..	1	..	..	..	..	..	..	1	..	1	1	1	1	121	14	..	..	5	2	7	..	7	16		143	35
1852	..	..	..	..	..	..	..	..	..	..	..	..	..	..	36	4	..	..	2	..	1	1	..	3	1852	39	8
Totals	..	1	..	..	..	..	..	..	1	..	8	10	1	4	268	45	..	..	10	3	9	1	9	20	Grand Total	306	84

Table XVI.

Number of Deaths and Injuries from various causes among
Engine Drivers.

Years.	Collision.		Off Line.		Running into Station.		Axle Breaking.		Machinery Breaking.		Falling from Train.		Jumping from Train.		Run over.		Collision at Station.		Mounting Train in motion.		Crushed.		Miscellaneous.		Years.	Total.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.		Killed.	Injured.
1840	..	4	..	..	1	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	1840	1	6
1841	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	..	..	..	..	..	..	..	2	1841	1	4
1842	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	2	..	..	..	1	..	..	..	..	1842	2	4
1843	..	..	..	..	..	..	..	..	1	..	1	3	..	..	..	..	..	..	1	..	..	..	..	1	1843	3	4
	..	4	..	..	1	..	..	..	1	..	3	6	..	..	1	4	..	..	1	1	..	..	..	3		7	18
1844	2	..	2	1	..	..	..	..	..	2	1	1	..	..	..	..	..	..	..	..	..	1	2	1	1844	7	6
1845	..	2	2	1	..	..	..	..	..	1	..	..	..	1	..	..	1	..	..	..	..	..	..	..	1845	3	5
1846	1	2	3	2	..	..	..	1	..	1	2	2	1	1	..	..	..	5	..	..	..	..	..	..	1846	7	14
1847	1	1	4	3	..	..	..	..	..	..	..	1	1	..	3	1	1	..	..	..	..	..	1	..	1847	11	6
	4	5	11	7	..	..	..	1	..	4	3	4	2	2	3	1	2	5	..	..	..	1	3	1		28	31
1848	1	..	2	5	..	..	..	..	1	1	..	..	..	1	..	..	..	3	1	..	1	1	..	..	1848	6	11
1849	1	2	2	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	2	3	2	1849	6	8
1850	..	1	..	2	..	..	..	..	2	3	..	..	..	..	..	..	1	3	..	..	..	..	1	2	1850	4	11
1851	..	..	1	2	..	..	..	..	2	1	3	..	..	..	..	..	..	1	1	..	2	..	2	1	1851	11	5
	2	3	5	9	..	..	..	..	5	7	3	..	..	1	..	..	1	7	2	..	3	3	6	5		27	35
1852	..	1	3	5	..	..	..	..	1	..	1	2	1	..	..	..	3	2	1	..	..	..	1	..	1852	11	10
Totals..	6	13	19	21	1	..	..	1	7	11	10	12	3	3	4	5	6	14	4	1	3	4	10	9	Grand Total	73	91

TABLE XVII.

Number of Deaths and Injuries from various causes among STOKERS.

Years.	Collision.		Off Line.		Running into Station.		Axle Breaking.		Machinery Breaking.		Falling from Train.		Jumping from Train.		Run over.		Collision at Station.		Mounting Train in motion.		Crushed.		Miscellaneous.		Years.	Total.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.		Killed.	Injured.
1840	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	5	..	..	1840	1	5
1841	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	1	1841	..	4
1842	1	1	..	..	..	..	..	..	..	..	1	2	..	1	2	1	..	..	..	..	..	..	..	..	1842	4	5
1843	..	..	..	..	..	..	..	..	..	..	1	4	..	..	..	..	..	..	1	..	..	..	..	1	1843	2	5
	1	1	..	..	..	..	..	..	..	..	2	8	..	1	3	2	..	..	1	..	..	5	..	2		7	19
1844	..	2	1	1	..	..	..	..	1	2	2	3	..	..	..	..	..	..	..	..	..	2	2	2	1844	6	12
1845	1	1	1	1	..	..	..	..	..	1	2	2	1	..	1	..	..	2	..	1	..	..	1	..	1845	7	8
1846	..	1	1	2	..	..	..	..	1	1	..	..	1	..	..	1	..	4	..	..	3	1	1	1	1846	7	11
1847	1	1	1	4	..	..	..	..	1	2	7	4	1	..	2	1	2	2	1	..	2	1	4	2	1847	22	17
	2	5	4	8	..	..	..	..	3	6	11	9	3	..	3	2	2	8	1	1	5	4	8	5		42	48
1848	..	2	1	3	..	..	..	..	2	1	4	..	1	1	2	1	..	2	..	..	4	3	..	1	1848	14	14
1849	1	..	2	..	..	..	..	..	3	..	3	4	..	..	..	..	1	..	2	1	..	..	1	2	1849	13	7
1850	1	..	..	1	..	1	..	..	2	1	5	1	1	..	2	..	1	2	..	..	..	2	4	..	1850	16	8
1851	1	..	2	1	..	..	..	..	..	1	2	1	..	1	..	..	..	2	..	..	1	1	..	3	1851	6	10
	3	2	5	5	..	1	..	..	7	3	14	6	2	2	4	1	2	6	2	1	5	6	5	6		49	39
1852	2	1	4	3	..	..	..	..	1	1	1	3	..	1	1	..	1	4	3	1	3	2	2	1	1852	18	17
Totals..	8	9	13	16	..	1	..	..	11	10	28	26	5	4	11	5	5	18	7	3	13	17	15	14	Grand Total	116	123

Table XVIII.

Number of Deaths and Injuries from various causes among

Guards.

Years.	Collision.		Off Line.		Running into Station.		Axle Breaking.		Machinery Breaking.		Falling from Train.		Jumping from Train.		Run Over.		Collision at Station.		Mounting Train in Motion.		Crushed.		Miscellaneous.		Years.	Total.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.		Killed.	Injured.
1840	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	1840	..	2
1841	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..	..	..	2	1	..	1841	1	5
1842	..	..	..	..	..	..	..	..	..	..	1	1	1	..	1	..	..	..	..	..	1	..	3	1	1842	7	2
1843	..	..	..	..	..	..	..	..	..	..	4	1	..	..	..	..	..	..	..	..	..	..	1	1	1843	5	2
	..	..	..	..	..	..	..	..	..	..	5	5	1	..	1	1	..	..	..	..	1	2	5	3		13	11
1844	..	1	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	4	4	1844	5	6
1845	..	1	..	2	..	..	..	..	..	..	4	2	..	..	1	..	..	..	..	..	..	..	1	2	1845	6	7
1846	..	..	..	3	..	..	..	..	..	1	4	1	..	..	2	..	1	1	..	..	1	1	1	2	1846	9	9
1847	2	1	1	1	..	..	..	..	..	..	2	2	..	..	..	1	..	2	1	..	1	2	3	..	1847	10	9
	2	3	1	6	..	..	..	..	..	2	11	5	..	..	3	1	1	3	1	..	2	3	9	8		30	31
1848	..	3	2	1	..	..	..	..	..	2	4	1	1	..	2	..	..	1	4	..	1	..	8	2	1848	22	10
1849	..	..	..	..	..	..	..	..	..	1	6	4	..	..	1	..	1	..	2	1	1	4	4	4	1849	15	14
1850	1	..	..	..	..	1	..	..	1	1	8	..	..	..	3	1	..	4	2	2	3	1	3	5	1850	21	15
1851	..	..	..	1	..	..	..	..	..	..	2	..	..	..	2	..	2	..	1	..	5	..	2	2	1851	14	3
	1	3	2	2	..	1	..	..	1	4	20	5	1	..	8	1	3	5	9	3	10	5	17	13		72	42
1852	..	2	3	3	..	..	..	..	..	..	1	2	..	..	1	1	..	..	..	..	1	2	6	6	1852	12	16
Totals..	3	8	6	11	..	1	..	..	1	6	37	17	2	..	13	4	4	8	10	3	14	12	37	30	Grand Total	127	100

Table XIX.

Number of Deaths and Injuries from various causes among Porters.

Years.	Collision.		Off Line.		Running into Station.		Axle Breaking.		Machinery Breaking.		Falling from Train.		Jumping from Train.		Run over.		Collision at Station.		Mounting Train in motion.		Crushed.		Miscellaneous.		Years.	Total.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.		Killed.	Injured.
1840	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1840	1	..
1841	..	..	..	..	..	..	..	..	..	..	1	1	1	..	1	1	..	1	..	..	..	..	1	..	1841	4	3
1842	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	..	..	..	..	1	1	..	..	..	1842	3	2
1843	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	5	3	1	1	1843	8	4
	..	..	..	..	..	..	..	..	..	..	3	2	1	..	2	1	..	1	2	1	6	3	2	1		16	9
1844	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	3	..	..	..	..	2	..	3	1	1844	6	4
1845	..	..	..	..	..	..	..	..	..	..	1	..	1	..	1	1	1	..	..	..	1	1	1	..	1845	6	2
1846	..	..	..	1	..	..	..	..	..	..	..	..	1	..	1	..	1	4	..	..	4	1	..	1	1846	7	7
1847	..	..	..	..	..	..	..	..	..	..	3	..	..	..	5	1	..	..	1	..	3	1	..	2	1847	12	4
	..	..	..	1	..	..	..	..	..	..	4	..	3	..	7	5	2	4	1	..	10	3	4	4		31	17
1848	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	3	1	4	4	..	1	1848	10	6
1849	..	..	..	..	..	..	..	..	..	..	1	1	1	..	6	..	..	..	..	..	4	3	1	4	1849	13	8
1850	..	..	..	..	..	..	..	..	..	..	1	..	..	1	4	..	..	..	..	..	2	1	2	3	1850	9	5
1851	..	..	1	..	..	..	..	..	..	..	..	2	..	..	3	..	1	1	1	1	8	2	5	5	1851	19	11
	..	..	1	..	..	..	..	..	..	..	2	3	1	1	16	..	1	1	4	2	18	10	8	13		51	30
1852	..	..	..	1	..	..	..	..	..	..	1	..	1	1	6	1	1	1	2	..	7	2	1	3	1852	19	9
Totals..	..	..	1	2	..	..	..	..	..	..	10	5	6	2	31	7	4	7	9	3	41	18	15	21	Grand Total	117	65

Table XX.

Number of Deaths and Injuries from various causes among

Other Servants.

Years.	Collision.		Off Line.		Running into Station.		Axle Breaking.		Machinery Breaking.		Falling from Train.		Jumping from Train.		Run over.		Collision at Station.		Mounting Train in motion.		Crushed.		Miscellaneous.		Years.	Total.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.		Killed.	Injured.
1840	..	..	..	..	..	..	..	..	..	..	..	2	1	1	9	2	..	..	..	..	2	3	..	..	1840	12	8
1841	..	..	..	1	..	..	..	..	..	..	1	1	2	2	19	11	..	..	..	..	..	3	1	..	1841	23	18
1842	..	2	..	..	..	..	..	..	..	..	3	3	2	1	17	11	..	..	1	2	3	2	1	1	1842	27	22
1843	..	1	..	..	..	..	..	..	..	..	5	2	1	..	11	4	..	..	..	2	4	2	..	2	1843	21	13
	..	3	..	1	..	..	..	..	..	..	9	8	6	4	56	28	..	..	1	4	9	10	2	3		83	61
1844	..	5	1	1	..	..	..	..	..	..	4	3	3	1	16	1	1	..	..	1	..	1	3	4	1844	28	17
1845	1	1	2	9	..	..	..	..	3	..	5	2	1	1	19	5	..	..	3	2	1	2	1	1	1845	36	23
1846	1	10	..	2	..	..	..	1	1	3	2	1	2	3	42	8	..	1	6	2	3	2	4	2	1846	61	35
1847	..	..	2	4	..	..	2	..	..	..	6	2	5	4	38	14	..	1	4	..	8	1	2	5	1847	67	31
	2	16	5	16	..	..	2	1	4	3	17	8	11	9	115	28	1	2	13	5	12	6	10	12		192	106
1848	1	10	..	..	..	..	..	..	..	3	10	1	1	3	45	4	5	1	6	3	14	5	4	3	1848	86	33
1849	1	3	..	..	..	..	..	..	..	1	3	5	2	1	41	1	..	..	6	5	9	8	20	17	1849	82	41
1850	1	..	..	..	..	..	..	..	1	1	5	3	3	1	39	..	..	1	3	2	13	1	14	13	1850	79	22
1851	1	..	1	..	..	..	2	..	..	1	8	1	1	2	25	3	2	..	3	4	9	4	11	6	1851	63	21
	4	13	1	..	..	..	2	..	1	6	26	10	7	7	150	8	7	2	18	14	45	18	49	39		310	117
1852	5	2	..	..	..	..	..	..	..	1	4	5	..	1	32	6	..	6	3	..	6	..	13	16	1852	63	37
Totals..	11	34	6	17	..	..	4	1	5	10	56	31	24	21	353	70	8	10	35	23	72	34	74	70	Grand Total	648	321

The preceding eight Tables have been given in the present very complete form, so as to permit other inquirers who may happen to take a different view of the manner in which the subject should be treated, to make new combinations for themselves. The following Table, XXI, on next page, shews, for three different periods of years, the ratio of the mortality per cent. from each cause to the mortality from all causes; and, so far as passengers are concerned, some of the results are rather curious.

It will be seen from the first section of this Table, that the deaths of passengers from collisions, and from trains running off the line, which constitute a large portion of the whole, have been gradually diminishing, while deaths from passengers falling from the trains have scarcely varied. Again, the deaths from axles breaking, in the four years 1840–3, formed 8 per cent. of the whole deaths in that period; but, since the year 1844, not a single death of a passenger has taken place assignable to that cause. And in regard to deaths from the breaking of other parts of the machinery none have happened since 1847.

In the latter part of 1840, the death of one passenger was occasioned by the running of a train into the station; but no other since that time, although 21 have been injured from the same cause at different periods. The deaths of passengers from collisions at stations increased subsequent to 1843, and have since remained nearly uniform at about 15 per cent. of the deaths from all causes.

The deaths occasioned by passengers jumping from trains while in motion have increased in a very remarkable manner ever since 1840, as well as the deaths from passengers mounting trains while in motion.

Results of the kind now enumerated, although given in strict accordance with the methods of many statistical inquirers, are, if given in such form only, liable to a serious objection, for in every case where the intensity of a variety of causes is being measured, the pressure of any one or more of the causes might actually be remaining constant, while the form of the preceding Table is capable of making them appear as increasing or decreasing in intensity: and *vice versâ*, the intensity of the same causes might in reality be undergoing great modifications, and at the same time appear uniform in the Table. An attentive consideration of the principle on which the Table is constructed will shew this to be the case; and the actual facts contained in it furnish an excellent illustration of these remarks. It will be seen that, in the period 1848–51, no deaths have taken place among passengers from the causes placed third, fourth, and fifth in order; and the immediate effect of the exclusion of deaths from these causes is to give an apparent augmentation of intensity to the remaining causes in operation in that period; a similar effect would also be produced, although not in degree the same, by any fluctuations whatever in the intensity of one or more of the causes. The proper use of such a Table as that now under consideration, is to direct attention to the fact of disturbing causes being in operation, but not to measure the degree or the exact amount of the intensity of each cause; which must be determined by a different method.

It is not easy, in a short paper, to follow a course of argument keeping clearly in view the many fluctuations in the ratio of deaths among a great variety of causes; but it

[is obvious

Table XXI.

Ratio of Mortality per Cent. from each cause, to the Mortality from all causes, among each Class of Persons.

Cause.	Passengers.			Public by their own Negligence.			Trespassers.			Engine Drivers.		
	1840—43.	1844—47.	1848—51.	1840—43.	1844—47.	1848—51.	1840—43.	1844—47.	1848—51.	1840—43.	1844—47.	1848—51.
Collision	11·48	16·18	7·48	...	...	...	...	...	...	...	14·29	7·41
Off line	22·95	7·35	14·95	...	...	...	...	...	...	...	39·29	18·52
Running into station	1·64	...	...	...	...	...	...	...	...	14·28	...	...
Axle breaking	8·19	1·47	...	...	...	...	...	...	...	...	...	...
Machinery ditto	...	2·94	...	...	...	...	...	...	·70	14·29	...	18·52
Falling from train	6·56	7·35	6·54	...	10·00	...	12·82	2·35	·70	42·86	10·71	11·11
Jumping from ditto	4·92	20·60	14·02	...	6·67	...	...	...	·70	...	7·14	...
Run over	1·64	1·47	14·95	100·00	73·33	75·81	79·49	94·12	84·61	14·28	10·71	...
Collision at station	9·84	16·18	14·95	...	...	...	...	...	...	...	7·15	3·70
Mounting train in motion	8·19	11·76	14·95	...	1·67	...	...	3·53	3·49	14·29	...	7·41
Crushed	3·28	2·94	·94	...	1·67	3·22	2·56	...	4·90	...	...	11·11
Miscellaneous	21·31	11·76	11·22	...	6·66	20·97	5·13	...	4·90	...	10·71	22·22

Cause.	Stokers.			Guards.			Porters.			Other Servants.		
	1840—43.	1844—47.	1848—51.	1840—43.	1844—47.	1848—51.	1840—43.	1844—47.	1848—51.	1840—43.	1844—47.	1848—51.
Collision	14·29	4·76	6·12	...	6·67	1·39	...	...	...	...	1·04	1·29
Off line	...	9·52	10·21	...	3·33	2·78	...	...	1·96	...	2·60	·32
Running into station	...	...	...	...	...	...	...	...	...	...	...	...
Axle breaking	...	...	...	...	...	...	...	...	...	...	1·04	·64
Machinery ditto	...	7·14	14·28	...	...	1·39	...	...	...	...	2·08	·32
Falling from train	28·57	26·20	28·57	38·46	36·67	27·77	18·75	12·90	3·92	10·84	8·86	8·39
Jumping from ditto	...	7·14	4·08	7·69	...	1·39	6·25	9·68	1·96	7·23	5·73	2·26
Run over	42·85	7·14	8·16	7·69	10·00	11·11	12·50	22·58	31·37	67·47	59·90	48·39
Collision at station	...	4·76	4·08	...	3·33	4·17	...	6·45	1·96	...	·52	2·26
Mounting train in motion	14·29	2·38	4·08	...	3·33	12·50	12·50	3·23	7·84	1·21	6·77	5·81
Crushed	...	11·91	10·21	7·70	6·67	13·89	37·50	32·26	35·30	10·84	6·25	14·51
Miscellaneous	...	19·05	10·21	38·46	30·00	23·61	12·50	12·90	15·69	2·41	5·21	15·81

is obvious that a number of the circumstances, under which railway accidents have taken place, are for many purposes susceptible of the very simple classification already more than once alluded to.

A large number of the deaths are assignable to causes over which it is evident the directors and managers have little, if any, control, such as—

(*a*) Passengers mounting trains while in motion.
(*b*) Passengers jumping from trains while in motion.
(*c*) Passengers falling from trains while in motion.
(*d*) Axles breaking.
(*e*) Machinery breaking.
(*f*) Passengers being run over.

And if all the remaining causes in the preceding Tables were placed to the credit of the management of railways, and held as coming in some measure under the control of the railway officers and servants of the companies, little exception can be taken to the classification on the ground that it is calculated to underrate their responsibilities.

The following Abstract will shew the results thus arrived at:—

ABSTRACT I.

CAUSES.	Number of Passengers.	
	Killed.	Injured.
(A) Beyond control of the Companies	119	171
(B) Under control of the Companies, (including miscellaneous group) . .	147	1,625
Ratio per cent. of (A) to the whole	44·7	9·5
Ratio per cent. of (B) to the whole	55·3	90·5

It will thus be seen, that about 44·7 per cent. of all the deaths has taken place from causes over nearly all of which the passengers themselves have control, the exception being the eight deaths included in causes (*d*) and (*e*), and for which the companies can scarcely be in any way held responsible. But in regard to the injuries, 9·5 per cent. only of the accidents are so circumstanced, which calls attention to a very remarkable feature in the results now under consideration.

(*a*) The deaths from causes beyond the control of the companies form 69·6 per cent. of the number of injuries from the same causes.
(*b*) The deaths from causes under the control of the companies are 9 per cent. of the number of injuries from the same causes; and

Hence the tendency of accidents, which may be considered to arise from details of management, is to inflict bodily injury rather than to occasion death; for in respect to every 100 injuries, 9 deaths take place from corresponding causes, while among the accidents due to causes within the influence of the passengers themselves, for every 100 injuries nearly 70 deaths occur.

This method of stating the results naturally leads to the inquiry, Do the accidents,

falling within the class of causes assumed to come under the control of the companies, increase or diminish?

The classification in Abstract I, it will be seen, includes the deaths of the miscellaneous groups in Tables IV to XI inclusive, and also those in Tables XIII to XX inclusive, as coming under the control of the companies; but it must be obvious, that some of these accidents will be due to causes over which the companies cannot be supposed to have any control whatever. The more correct comparison will therefore evidently be that between ascertained causes only; and the following Abstract is so corrected:—

ABSTRACT J.

CAUSES.	Deaths of Passengers during					
	1840—43.		1844—1847.		1848—1851.	
	Number.	Per-Centage of Total.	Number.	Per-Centage of Total.	Number.	Per-Centage of Total.
Beyond control of Companies .	18	37·50	31	51·67	54	56·84
Under control of Companies . .	30	62·50	29	48·33	41	43·16

It will thus be seen, that the deaths from causes under the control of the companies have, in reference to the total deaths from all causes, been gradually diminishing ever since 1840.

In the period 1840–43	the deaths from all causes under the control of the Companies	= 62·50 per cent. of all the deaths.
... 1844–47		= 48·33 ...
... 1848–51		= 43·16 ...

So that it is evident, that the class of accidents under the control of the several companies is decreasing in relation to the total accidents in a most satisfactory and very rapid manner.

In order to avoid the objections which might be urged against the preceding mode of comparison, prominently referred to in speaking of Table XXI preceding, the following arrangement of the facts is given, which is faultless as a test, but establishes the same conclusion arrived at from a consideration of Abstract J.

ABSTRACT K.

CAUSES.	Period of Observation.		
	1840—43.	1844—47.	1848—51.
Number of Passengers.	57,617,587	156,698,002	264,173,027
Deaths from Causes beyond control of Companies	18	31	54
Deaths from causes under control of Companies .	30	29	41
Ratio of deaths beyond control of Companies . .	One in 3,200,977	One in 5,054,774	One in 4,892,093
Ratio of deaths under control of Companies . .	1,920,585	5,403,379	6,443,244

There is here evidence, not only of a great diminution of all kinds of accidents to passengers, but, what is exceedingly satisfactory, of those accidents which are due to causes assumed to be under the control of the companies, in a very remarkable degree compared with the remaining class of accidents.

For while deaths from causes beyond the control of the companies have, between the periods of 1840–43 and 1848–51, diminished in the ratio of 49 to 30, those from causes under the control of the companies have diminished in the ratio of 64 to 19. This result is certainly one not generally understood by the public, for not only are all railway accidents supposed to be very much on the increase, but, those due to details of management, are believed to be rapidly and alarmingly so. The facts of the case do not support this view, for they disclose the truth, that railway management, so far as accidents producing deaths among passengers are concerned, has greatly improved, and apparently in a high and steady ratio.

In the period 1840–43	the deaths from causes under the control of the Companies	= One in 1,920,585	Passengers.
... 1844–47		= ... 5,403,379	...
... 1848–51		= ... 6,443,244	...

So that this class of accidents has diminished to about 30 per cent. of its frequency and magnitude in the year 1843.

These results, viewed in connection with those of Abstract H, give birth to some interesting considerations. If regard be had to the causes of railway accidents, so far as they can be controlled by the companies, it is obvious that the increasing extent and complicated system of the railway communication, as it now exists in its ramified arteries over the country, together with the modifications in passenger traffic of recent years, enumerated in Clauses 1st, 2nd, and 3rd, of page 238, would, unless greatly improved management were keeping pace with the growing extent of railway traffic, lead to an immense increase in the number of accidents, not only absolutely, but relatively to the amount of that traffic.

If, therefore, the results of Abstracts H and K be borne in mind, which shew that the loss of life among passengers, from all causes, has decreased in recent years, and that at the same time, the class of deaths which have taken place from causes under the control of the companies, has, in relation to the whole of these reduced deaths, been subject, year after year, to a greatly increased rate of reduction (as shewn in Abstract K), every one, notwithstanding the present popular outcry, must be satisfied that means and influences are actively at work which are daily increasing the safety of life in railway travelling. Whether this change be due to the better general regulations enforced by the directors of the companies, or to the improved skill and intelligence of their officers and servants, still the results of this inquiry afford the most striking testimony to the recent improvement and increased safety in railway travelling; and encourage the hope that the same means will be persevered in to effect a still further reduction in the frequency and intensity of railway accidents.

An inspection of Tables XIII and XXI will shew the relative number of deaths arising from each cause; and, in regard to those accidents supposed to be under the control of the companies, the most important are those under the head of collisions and running off the line. It has been said of late, that the great bulk of all the railway accidents is due to collisions; but an inspection of Table XXI will shew that—

Collisions at stations constitute 15·0 per cent. of the whole deaths among passengers.
Other collisions, not at stations, 7·5 ... ...

In all . . . . . 22·5 per cent. of the whole deaths among passengers.

When, however, we arrive at that point of this inquiry in which the rate of deaths of all classes of persons, including employés, is considered, it will be found, that of a total of 1828 deaths, not more than 119, or not one-fifteenth, has been occasioned by collisions of all sorts. Collisions do not, therefore, appear to affect railway servants so much as other causes. As they form, however, more than a moiety of all the accidents assignable to causes under the control of the companies, it may be important to view this group of casualties by itself. And the following Abstract will shew the ratio of collisions in different periods:—

ABSTRACT L.

PERIOD.	Number of Passengers.	Collisions, not at Stations.		Collisions at Stations.	
		Number of Killed.	Being one in	Number of Killed.	Being one in
1840–43	57,617,578	7	8,231,082	6	9,602,929
1844–47	156,698,002	11	14,245,273	11	14,245,273
1848–51	264,173,027	8	33,021,628	16	16,510,814
1840—1851	478,488,607	26	18,403,408	33	14,499,655

An examination of the fourth and sixth columns of this Abstract shews, that even this class of accidents, on which so much importance has been placed, is rapidly diminishing in amount, the deaths by collisions at stations having, in the last period of observations above enumerated, decreased to about 58 per cent. of the ratio in the first period; and those by other collisions having actually been reduced in the most recent period to only 25 per cent. of their ratio in the earliest period. These results are of great importance; and while they are very satisfactory in shewing a diminution of deaths from all kinds of collisions, they are further practically useful in proving, that while the deaths have been reduced to one-fourth in one group of collisions, they have undergone a reduction to the extent of 42 per cent. only in the collisions at stations. This ought to awaken attention to the latter group of accidents; and those entrusted with the general superintendence of the stations should have the subject forced upon their notice.

Collisions of railway trains being one of the many causes of accidents which come so obviously under the control and management of the companies, they have been thought of sufficient importance to justify a very minute analysis of them, with the view of pointing

out the peculiar circumstances under which they usually take place, in order to be suggestive of means for their prevention for the future.

In this part of the inquiry, it has been found impossible to pursue the subject further back than the beginning of 1844; and, therefore, the observations will be confined to the nine years 1844–52 inclusive. Collisions, as may be easily supposed, take place under a great variety of circumstances; and it is often a difficult matter to arrange them under any well defined system of classification; consequently, in the following Tables, such cases only were included in the respective groups, as distinctly and unmistakeably contained some common and important characteristic, and all anomalous cases are, therefore, placed in a miscellaneous group by themselves.

Heretofore, in using the word accidents, it has meant accident to life, and has been used synonymously with "loss of life" or death; but many collisions take place unattended with fatal consequences; and, although we shall hereafter shew the loss of life consequent on each kind of collision, still it is important to discuss, in the first place, the conditions under which collisions of various kinds do take place,—therefore, in the following Table, XXII, no notice is taken of the number of persons killed and injured.

In treating of the deaths of passengers in the preceding part of this paper, it was assumed that all collisions were due to causes over which the company had control; but, in the following Table it will be seen, that of the 174 classified collisions, as many as 28 took place under circumstances which it is, to a very great degree, impossible to control, and, in fact, the collisions were of a nature, against which it would at all times be exceedingly difficult to use precautions which would effectually prevent them. They will be found in Section A of the following Table, and are all more or less accounted for by the state of the weather. Fog-signals, and some other appliances, might, in a few of these instances, be made available; but in the majority of the cases it is difficult to suggest a certain remedy.

Sections B and C of this Table may be considered to embrace collisions, the causes of which are certainly, to a very great extent, completely under the control of the companies; and it must appear to every inquirer that, of the 34 collisions in Section B, the great bulk were absolutely preventable by a sufficient amount of care. For example, of the 18 collisions enumerated in columns (*a*), (*b*), (*c*), and (*d*) of this section, 15 are due to portions of the trains becoming detached, and three to defective "breaks;" and it is difficult to conceive any sufficient reason to justify a continuance or repetition of accidents from these causes. No doubt the couplings of carriages may, under extraordinary circumstances, be found to give way, even when great vigilance has been used; but such an excuse can be of no avail in the face of so many accidents of this kind as are now under consideration, and there certainly does appear strong reason to condemn the system of management which permits a series of collisions from these causes. Again, it will be found that no less than 16 collisions took place, owing to the trains having been retarded by accidents to some portion or other of the engine. It is, no doubt, sometimes difficult to determine

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Table XXII.

An Analysis of Causes of Collisions on Railways in Great Britain and Ireland, from 1844 *to* 1852 *inclusive.*

Year.	Not under control of the Companies.				Partly under Control.	Entirely, or to a very great extent, under Control of the Companies.												
	A. State of the Weather.					B. Defects of Machinery.				C. Neglect.						D. Other Causes.		
						Coupling Chains.			Breaks.	Engine.									
	(a.) Fog or Storm.	(b.) Rails Slippery, (generally caused by Fog.)	(c.) Train retarded by Wind, and over-taken.	(d.) Waggons or Parts of Trains Blown on to Line. Generally Neglect of Pointsmen.	(a.) Part of Train be-coming detached on Incline and running back.	(b.) Part of Train be-coming detached and left on Line.	(c.) Train giving way in or about Middle. Hinder part running into Fore part by its own Impetus.	(d.) Faulty Breaks.	(e.) Train or Engine retarded or stopped by Accident to Engine.	(a) Of Signals Gene-rally.	(b.) Of Engine Driver, by either Neglect-ing Signals or Careless Driving	(c.) Of Breaks-man, (some-times with Driver.)	(d.) Of Points-men, or Points not Acting.	(e.) Of Station-Masters, some-times in conjunc-tion with others.	(f.) Waggons or Parts of Trains left on Line.	(a.) Train lost Speed and was over-taken.	(b.) Steam or Water Failed.	(c.) Miscel-laneous, and not specified, but all attribut-able to Neglect on the part of Servants of the Companies.
1844	4	2	1	1	..	1	..	1	1	1	..	..	..	1	3	..	..	2
1845	1	1	..	2	..	..	..	..	1	2	7	..	..	..	1	1	..	11
1846	2	..	..	..	..	..	1	1	2	3	6	1	1	1	3	2	1	11
1847	..	3	..	..	..	1	..	..	3	4	6	2	5	1	2	..	3	10
1848	..	..	..	..	1	..	..	..	3	..	7	..	3	1	2	..	..	19
1849	1	..	..	1	2	1	..	..	..	3	1	..	1	..	2	..	1	15
1850	2	..	..	2	2	..	..	..	..	2	6	..	1	..	1	..	..	26
1851	1	1	..	..	1	1	1	..	5	1	5	..	2	..	1	..	..	19
1852	..	2	..	1	..	1	2	1	1	2	9	1	2	..	1	..	..	21
Totals	11	9	1	7	6	5	4	3	16	18	47	4	15	4	16	3	5	134

on inspection, the defects in the mechanism of an engine, still the collisions from this cause have been so many, that it is impossible to conceive that a due amount of scrutiny has been always exercised in the determination of the state of the locomotives. Greater precautions have of late years been taken to guard against this class of accidents, and greater knowledge also now exists as to what constitutes durability and efficiency in many parts of the machinery; it is, therefore, to be hoped, that still further improvements will, in these respects, yet take place, and prevent collisions from any such causes. In fact, an examination of column (*e*), Section B, of this Table is sufficient to shew, that during the last four years a marked improvement has taken place.

The collisions in the five years 1844–48, from the causes now under consideration = 10, and
In the four years 1849–52 . . . . . = 6

But in the former period, the extent of railway mileage was to that in the latter as 15,337 to 25,529, and consequently if this kind of collision had taken place in the latter period in the same ratio as in the former, the number would have been nearly 17, while, in fact, it amounted to only 6. And there appears no sufficient reason why this improvement should not continue until all such accidents, or nearly all, disappear.

The next Section, C, of this Table includes a class of collision of a most serious character, and of an alarming extent. It is, perhaps, impossible to bring any direct charge against the directors and superior officers, on account of the culpable neglect on the part of the inferior servants, to which these accidents are immediately due; but the very enormous extent of them should call forth some more effective system of supervision to enforce a faithful and certain observance of the regulations of the companies. Of the 174 collisions, of which the causes are classified in Table XXII, the extraordinary number of 104 have arisen out of what can be described as nothing but most culpable neglect.

18 are due either to the neglect or mismanagement of signals.
47 have arisen from drivers neglecting signals, and other kinds of careless driving.
4 are due to the omission of the use of the "break."
15 are owing to pointsmen neglecting their duty.
4 are owing to the neglect or carelessness of station masters. And
16 have been occasioned by the inexcusable neglect of leaving waggons and portions of trains on the line, when the same line was in use by other trains; this last cause has, however, nearly disappeared during the three years 1850–52, not more than one collision yearly having taken place.

In Section D, of the last Table XXII, it will be found that column (*c*) contains no less than 134 cases of collision, which it has been found impossible to classify in a satisfactory manner; but they are all attributable to neglect on the part of the servants of the companies.

The facts recorded in this Table are of grave importance; and, although the directors of railway companies have in recent years done an immense deal to protect passengers against loss of life and limb, they are still imperatively called on to take the subject of the frequently recurring collisions more thoroughly into consideration. When such most culpable neglect exists, as is evident by this Table, the public have a right to demand more complete protection.

The next Table to be considered is Table XXIII, which follows the same principles of classification as the Table immediately preceding, only that in addition, the number of deaths and injuries due to each kind of collision is specified, for *employés* as well as passengers.

From this Table a very clear notion may be formed of the danger to life and limb of passengers by collisions taking place from different causes. It would appear that—

(A) The 28 collisions, from causes assignable to the state of the weather, produced	2 deaths and 69 injuries.		
(B) The 34 collisions, from defects and breakage of machinery produced	11	...	208 ...
(C) The 104 collisions, arising from classified causes of neglect in railway servants, produced	21	...	305 ...
(E) And the 134 collisions arising from unclassified causes, produced	16	...	581 ...

It hence follows, that in each of the above groups the ratios of deaths and injuries to passengers were as follows:—

In group	(A),	each collision produced	·071	deaths and	2·464 injuries.
...	(B),	...	·324	...	6·118 ...
...	(C),	...	·202	...	2·933 ...
...	(E),	...	·119	...	4·336 ...

And Group B, or collisions arising from defects and breakage of machinery, has evidently the greatest tendency to occasion not only death, but likewise injuries to passengers, in relation to the number of collisions. This is not quite in accordance with the features attendant on railway accidents generally, in which it will be observed that those causes usually most fatal to life are accompanied with a reduced ratio of injuries. This will appear in a strong light when the part of this inquiry, relating to *employés*, is considered.

An examination of the final columns of Table XXIII will shew that the ratio which the number of injuries bears to the number of deaths arising from collisions differs very widely from that from accidents from all causes, as exhibited in Abstract G, both as regards passengers and servants of the companies.

Class of Accidents.	The Ratio of Injured to Killed.	
	Passengers.	Employés.
All causes in the aggregate	675·20 per cent.	65·03 per cent.
Collisions only	2301·96 ...	225·49 ...

It hence follows that the injuries greatly exceed the deaths amongst passengers in both of the above classes of accidents. On the other hand, the deaths amongst employés exceed the injuries from all causes in the aggregate; but in the class of collisions, the injuries, as with passengers, much exceed the number of deaths.

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Table XXIII.

Shewing the Number of Deaths and Injuries, to Railway Employés and to Passengers, due to each cause of Collision, on the Railways of Great Britain and Ireland, from the year 1844 to the Year 1852, inclusive.

Year.	A. Weather. *a, b, c,* Not under Control of the Companies.					A. Weather. *d* Partly under their Control.					A. Weather. Total.					B. Defects or Breakage of Machinery.					D. Loss of Speed, or Steam or Water failed.					Neglect. C. From known Causes.					Neglect. E. From Miscellaneous and unascertained Causes.					Neglect. Total.					Grand Total.				
	Number of Collisions.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	Number of Collisions.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	Number of Collisions.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	Number of Collisions.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	Number of Collisions.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	Number of Collisions.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	Number of Collisions.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	Number of Collisions.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	Number of Collisions.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.
1844	7	...	1	...	12	1	...	...	...	...	8	...	1	...	12	3	1	...	1	4	...	...	...	...	...	5	...	5	2	35	2	...	1	2	9	7	...	6	4	44	18	1	7	5	60
1845	2	...	...	...	4	2	...	...	...	...	4	...	...	...	4	1	...	...	...	...	1	...	...	1	...	10	3	4	3	36	11	...	3	...	26	21	3	7	3	62	27	3	7	4	66
1846	2	1	...	...	4	...	...	...	...	...	2	1	...	...	4	4	1	4	2	6	3	...	3	...	...	15	...	15	...	39	11	...	6	2	28	26	...	21	2	67	35	2	28	4	77
1847	3	...	1	2	1	...	...	...	...	...	3	...	1	2	1	4	1	...	...	...	3	...	...	...	11	20	1	8	7	22	10	4	...	...	7	30	5	8	7	29	40	6	9	9	41
1848	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	1	2	...	19	...	...	...	...	...	13	4	12	6	52	19	2	8	1	34	32	6	20	7	86	36	7	22	7	105
1849	1	1	1	...	...	1	...	...	...	...	2	1	1	...	...	3	1	1	...	6	1	...	...	...	...	7	2	3	...	2	15	2	2	...	58	22	4	5	...	60	28	6	7	...	66
1850	2	...	1	...	19	2	...	...	...	12	4	...	1	...	31	2	4	...	...	1	...	...	...	...	...	10	...	4	...	12	26	6	9	8	93	36	6	13	8	105	42	10	14	8	137
1851	2	1	...	...	4	...	...	...	...	...	2	1	...	...	4	8	...	...	8	116	...	...	...	...	...	9	3	3	...	28	19	3	1	1	153	28	6	4	1	181	38	7	4	9	301
1852	2	...	2	...	13	1	...	...	...	...	3	...	2	...	13	5	3	...	...	56	...	...	...	...	...	15	4	8	3	79	21	2	7	2	173	36	6	15	5	252	44	9	17	5	321
Totals	21	3	6	2	57	7	...	...	...	12	28	3	6	2	69	34	12	7	11	208	8	...	3	1	11	104	17	62	21	305	134	19	37	16	581	238	36	99	37	886	308	51	115	51	1174

The letters at the head of the columns refer to those in the Analysis of Causes of Collisions. The Accidents in col. A_d would, probably, be always traceable to Neglect of Pointsmen. Those in col. D would be, in general, attributable to Neglect.—See Analysis of Causes.

A curious and very interesting analysis of railway collisions will be found in the two next succeeding Tables, XXIV and XXV.

Table XXIV.

Shewing the Number of Collisions in each Year, from 1844 *to* 1852, *inclusive, with Number of Employés and Passengers Killed and Injured thereby.*

Year.	*a.* Passenger Trains into Passenger Trains.					*b.* Passenger into Other Trains.					*c.* Other into Passenger Trains.					*d.* Other Trains into Other Trains.					Totals.				
	Number of Collisions.	Employés.		Passengers.		Number of Collisions.	Employés.		Passengers.		Number of Collisions.	Employés.		Passengers.		Number of Collisions.	Employés.		Passengers.		Number of Collisions.	Employés.		Passengers.	
		Killed.	Injured.	Killed.	Injured.		Killed.	Injured.	Killed.	Injured.		Killed.	Injured.	Killed.	Injured.		Killed.	Injured.	Killed.	Injured.		Killed.	Injured.	Killed.	Injured.
1844	4	...	5	3	34	10	1	2	2	17	3	...	...	...	7	1	...	...	...	2	18	1	7	5	60
1845	4	...	...	1	6	13	1	3	...	24	8	1	2	3	36	2	1	2	...	...	27	3	7	4	66
1846	2	...	...	...	3	19	1	14	2	39	3	...	3	1	35	11	1	11	1	...	35	2	28	4	77
1847	6	...	1	...	17	18	2	3	9	19	3	..	...	...	5	13	4	5	...	...	40	6	9	9	41
1848	7	...	2	1	23	17	5	11	6	62	6	1	2	...	18	6	1	7	...	2	36	7	22	7	105
1849	4	...	...	...	13	14	1	1	...	16	3	...	...	...	36	7	5	6	...	1	28	6	7	...	66
1850	8	...	1	5	52	16	3	7	1	55	13	5	1	...	29	5	2	5	2	1	42	10	14	8	137
1851	7	...	...	6	156	23	5	3	...	80	6	...	...	3	65	2	2	1	...	...	38	7	4	9	301
1852	6	...	1	2	25	26	2	14	2	243	6	...	...	1	53	6	7	2	...	...	44	9	17	5	321
Totals	48	...	10	18	329	156	21	58	22	555	51	7	8	8	284	53	23	39	3	6	308	51	115	51	1,174

Of the 308 collisions recorded in Table XXIV, it will be found that—

(*a.*) 48 have consisted of one passenger train coming into collision with another.

(*b.*) 156 have consisted of collisions by passenger trains running into trains of another description, such as luggage, coke, mineral, contractors', &c., trains.

(*c.*) 51 have been occasioned by other than passenger trains running into passenger trains. And

(*d.*) 53 collisions happened by trains, not passenger trains, running into other trains, which were also not passenger trains.

It may be said, that in all the preceding four groups the public, as passengers, were interested, and even the last group, it will be found, records that three passengers were killed and six injured, although the trains were not passenger trains. These deaths and injuries took place amongst persons in charge of horses and cattle.

A very characteristic distinction in the number of collisions, under Groups (*b*) and (*c*), is observable. Group (*b*) shews the number of passenger trains running into others not passenger trains, while Group (*c*) is the converse kind of collision. Now as passenger trains usually run at a higher speed than the other trains, the greater number of collisions is occasioned by the passenger trains overtaking the others, the difference being almost exactly three times as great.

What is also somewhat curious to observe in the Table under consideration is, the rather close approximation in the number of collisions with each other of trains of a similar kind. The collisions among exclusively passenger trains were, in the nine years, exactly 48; and the collisions in the same period among trains, exclusively other than passenger trains, were 53.

The following shews the ratio of deaths and injuries among passengers in each group of collisions in Table XXIV:—

In Group	(*a*),	each collision produced	·375	deaths and	6·854	injuries.
...	(*b*),	...	·141	...	3·558	...
...	(*c*),	...	·157	...	5·569	...
...	(*d*),	...	·057	...	0·113	...

The highest ratio of deaths, and also of injuries, in the above four combinations, will be found in Group (*a*); and for this there is a very obvious explanation, for the collision in this group consists of one passenger train running into another; consequently, in every such collision, taking one with another, there will be double the number of passengers exposed to risk, which will be found exposed to such risks in collisions under Group (*b*); and it is rather singular to find, in an inquiry of this kind, so very positive a determination to the development of a law of mortality, when so many disturbing causes might have been considered to influence the results. If the ratio of deaths and injuries in Group (*a*) be divided by two, the results will be, ratio of deaths ·187, and ratio of injuries 3·427, not differing widely from the results of Group (*b*), nor from the results of Group (*c*), so far as regards deaths.

Another obvious and important result, arising out of this Table, is the caution indicated in regard to the position of passenger to other trains on the line; for it is the mismanagement of this detail which occasions fully one-half of the whole collisions which take place.

Table XXV.

Shewing the Number of Collisions occurring to each class of Passenger Trains, as compared with those occurring to all Passenger Trains, and to each other; with the Deaths and Injuries occasioned thereby, from 1844 *to* 1852, *inclusive.*

Year.	*a.* Express.						*b.* Mail.						*c.* Ordinary Passenger Trains.						*d.* Excursion.						Total. ($a + b + c + d$.)					
	Number of Collisions.		Employés.		Passengers.		Number of Collisions.		Employés.		Passengers.		Number of Collisions.		Employés.		Passengers.		Number of Collisions.		Employés.		Passengers.		Number of Collisions.		Employés.		Passengers.	
	Not resulting in Injuries.	Resulting in Injuries.	Killed.	Injured.	Killed.	Injured.	Not resulting in Injuries.	Resulting in Injuries.	Killed.	Injured.	Killed.	Injured.	Not resulting in Injuries.	Resulting in Injuries.	Killed.	Injured.	Killed.	Injured.	Not resulting in Injuries.	Resulting in Injuries.	Killed.	Injured.	Killed.	Injured.	Not resulting in Injuries.	Resulting in Injuries.	Killed.	Injured.	Killed.	Injured.
1844	..	..	..	..	..	..	3	..	..	..	..	..	3	10	1	7	4	57	..	1	..	..	1	1	6	11	1	7	5	58
1845	..	..	..	..	..	..	..	2	..	..	..	4	4	19	2	5	4	62	..	..	..	..	..	..	4	21	2	5	4	66
1846	..	1	..	2	..	..	1	1	..	..	..	4	6	15	1	15	3	73	..	..	..	..	..	..	7	17	1	17	3	77
1847	1	1	..	..	..	1	3	..	..	..	..	..	6	15	2	4	9	32	..	1	..	..	..	8	10	17	2	4	9	41
1848	1	2	1	4	1	10	1	4	4	6	..	4	6	16	1	5	6	89	..	..	..	..	..	..	8	22	6	15	7	103
1849	..	..	..	..	..	..	..	1	..	..	..	1	7	11	1	1	..	62	1	1	..	..	..	2	8	13	1	1	..	65
1850	..	..	..	..	..	..	..	2	..	..	..	10	5	30	8	9	6	126	..	..	..	..	..	..	5	32	8	9	6	136
1851	..	1	..	..	..	1	..	1	..	..	..	2	3	27	5	3	9	235	..	4	..	..	..	63	3	33	5	3	9	301
1852	1	3	1	5	..	14	..	2	..	2	..	11	2	30	1	8	5	296	..	..	..	..	..	..	3	35	2	15	5	321
Totals.	3	8	2	11	1	26	8	13	4	8	..	36	42	173	22	57	46	1,032	1	7	..	..	1	74	54	201	28	76	48	1,168

The next Table, XXV, gives a still further analysis of the passengers, by shewing the number of collisions to each kind of train, whether "express," "mail," "excursion," or ordinary train; and further distinguishes, among the collisions to each of these trains, the number which have resulted in injury to life or limb, and the number of collisions unattended with injury. Other than passenger-trains are excluded.

In this Table, it will be observed, that the collisions of the "express" and "excursion" trains have occasioned but one death each throughout the whole period of nine years, while the collisions of "mail" trains were not attended with a single death to a passenger. So far as collisions are concerned, this ought to satisfy the minds of the timid of the safety of travelling by quick trains.

The following is a condensed Abstract of Table XXV, in respect to passengers only:—

ABSTRACT M.

Trains.	Number of		Number of Passengers.		Ratio of Deaths and Injuries to			
					All Collisions.		Serious Collisions.	
	Non-serious Collisions.	Serious Collisions.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Express	3	8	1	26	·091	2·364	·125	3·250
Excursion	1	7	1	74	·125	9·250	·143	10·571
Mail	8	13	...	36	...	1·714	...	2·769
Ordinary	42	173	46	1,032	·214	4·800	·266	5·965
Total . . .	54	201	48	1,168	·188	4·580	·239	5·811

It will thus be seen, that the ordinary trains have been fatal to life above the average. It will, however, be observed, that although the excursion trains have occasioned fewer deaths than the ordinary trains, yet the ratio of persons injured is nearly double the average. It will, likewise, be observed, that one-fifth part of all the collisions with passenger-trains are unattended with injury.

The following Table, XXVI, which includes collisions by other as well as passenger-trains, is interesting.

One remarkable feature in this Table is, the disparity in the frequency of collisions in different months of the year. It will be seen that, in the six months commencing with August and ending with January, the number of collisions is more than double of the number in the other six months of the year. This is, no doubt, to be in part accounted for by the state of the weather, as may be understood on referring to Section A of Tables XXII and XXIII; but still this would not of itself be sufficient to account for the remarkable difference observable in the preceding Table, unless it be that the "neglect," recorded in Section C of Table XXII and Section E of Table XXIII, be also to some extent occasioned by the trying nature of the weather at the same season. Another curious circumstance is the fact that in the last six months of this Table, in which double the number of collisions have taken place, not quite so many lives of passengers have been

lost, although the passenger traffic of the same six months is greater than in the other six months. For the nine years now under consideration, the passenger traffic of the first six months was 240,307,731, the passenger traffic of the second six months was 302,959,421. And, consequently, the deaths from collisions, during the first six months, were one in every 9,242,605 passengers; and, during the second six months, were one in every 12,118,577 passengers. So that those figures represent the relative chances of loss of life from collisions in railway travelling during the respective seasons, assuming that such accidents should for the future observe the same order of distribution.

TABLE XXVI.

Shewing the Number of Collisions on the Railways of Great Britain and Ireland for the nine Years 1844—1852, *for each Month of the Year, with the Number of Employés and of Passengers Killed and Injured thereby.*

Month.	Number of Collisions.			Employés.		Passengers.	
	Total.	Not resulting in injury to Life or Limb.	Resulting in Injuries.	Killed.	Injured.	Killed.	Injured.
February	13	4	9	2	6	...	15
March	15	4	11	2	2	...	30
April	10	3	7	...	4	6	110
May	21	4	17	4	...	11	75
June	15	...	15	3	8	7	57
July	25	4	21	3	17	2	127
Totals	99	19	80	14	37	26	414
August	37	7	30	3	12	11	200
September	32	4	28	7	7	3	137
October	35	8	27	8	18	4	102
November	36	8	28	5	16	3	177
December	41	11	30	7	15	4	103
January	28	12	16	7	10	...	41
Totals	209	50	159	37	78	25	760
Totals of 12 months	308	69	239	51	115	51	1,174

In respect of injuries to passengers, it will be observed, that in frequency they follow almost the precise order of the collisions themselves—the ratio to collisions in the different seasons being nearly the same. The facts in this Table are well worth examination by those intrusted with the management of Railways. It is scarcely possible to conceive that any intelligent superintendent of the trains of a railway, who thoroughly masters the facts in regard to collisions contained in Tables XXII to XXVI inclusive, could not devise some means which would prevent the recurrence of so many accidents of this class.

The only remaining Table now to be brought forward on the subject of collisions is the following one, Table XXVII, in which are shewn the places on the line at which the various collisions have taken place.

[It will be

Table XXVII.

Shewing the Localities where all Collisions, from 1844 to 1852, inclusive, occurred, with the Deaths and Injuries to Railway Employés and to Passengers caused thereby; also the Number of Collisions unattended or attended by Injury for each of the above Years.

Year.	*a.* At or near Station or Terminus.						*b.* At or near Junction.						*c.* At Sidings or Crossings.						*a + b + c.* Total at Stations, Junctions, and Crossings.						On Open Line.						Grand Total.					
	Number of Collisions.		Employés		Passengers.		Number of Collisions.		Employés		Passengers.		Number of Collisions.		Employés		Passengers.		Number of Collisions.		Employés		Passengers.		Number of Collisions.		Employés		Passengers.		Number of Collisions.		Employés.		Passengers.	
	Not resulting in Injury.	Resulting in Injury.	Killed.	Injured.	Killed.	Injured.	Not resulting in Injury.	Resulting in Injury.	Killed.	Injured.	Killed.	Injured.	Not resulting in Injury.	Resulting in Injury.	Killed.	Injured.	Killed.	Injured.	Not resulting in Injury.	Resulting in Injury.	Killed.	Injured.	Killed.	Injured.	Not resulting in Injury.	Resulting in Injury.	Killed.	Injured.	Killed.	Injured.	Not resulting in Injury.	Resulting in Injury.	Killed.	Injured.	Killed.	Injured.
1844	1	1	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	3	5	11	1	7	5	57	6	12	1	7	5	60
1845	1	6	1	2	1	14	..	1	..	..	..	3	..	3	..	2	..	9	1	10	1	4	1	26	3	13	2	3	3	40	4	23	3	7	4	66
1846	3	8	..	9	1	42	..	..	..	..	..	..	..	3	..	6	..	21	3	11	..	15	1	63	9	12	2	13	3	14	12	23	2	28	4	77
1847	2	6	2	2	..	16	..	..	..	..	..	..	2	4	..	3	7	7	4	10	2	5	7	23	13	13	4	4	2	18	17	23	6	9	9	41
1848	2	14	..	6	7	76	2	1	..	..	..	1	1	4	1	1	..	4	5	19	1	7	7	81	5	7	6	15	..	24	10	26	7	22	7	105
1849	2	6	1	1	..	35	..	2	1	1	..	4	..	1	..	..	..	1	2	9	2	2	..	40	7	10	4	5	..	26	9	19	6	7	..	66
1850	1	21	2	9	6	100	..	1	1	..	..	..	..	..	..	..	..	..	1	22	3	9	6	100	4	15	7	5	2	37	5	37	10	14	8	137
1851	1	16	4	4	1	127	..	2	1	..	..	9	..	1	1	..	..	..	1	19	6	4	1	136	1	17	1	..	8	165	2	36	7	4	9	301
1852	1	18	5	9	2	169	..	3	..	1	1	27	..	2	..	..	..	2	1	23	5	10	3	198	3	17	4	7	2	123	4	40	9	17	5	321
Totals.	14	96	15	42	18	582	2	10	3	2	1	44	3	18	2	12	7	44	19	124	20	56	26	670	50	115	31	59	25	504	69	239	51	115	51	1,174

It will be found that, of a total number of 308 collisions, no less than 110 have taken place at stations, or the very places where the greatest care and vigilance are required and might be exercised. Anything like fair attention to the use of well understood precautions, and a proper use of signals and telegraphs, should completely, or at all events to a great extent, prevent this class of accidents. The same remarks may be justly made in respect to the collisions recorded in Sections *b* and *c* of the same Table. The collisions in the first three sections of this Table constitute about 46 per cent. of the whole number, and are clearly of a kind that may be greatly diminished by a well devised system of management. The accidents from collisions on open lines, or rather at other places than stations, junctions, sidings, and crossings, amount to 165. The intensity of the different kind of collisions in this Table, in death and injury, does not exhibit any very marked disparity.

The only other important class of accidents, from which passengers suffer, and which is assumed to be under the control or management of the companies, are those occasioned by trains, or portions of trains, running off the line.

Of the 228 deaths of passengers from defined causes, given in Table XIII, it will be found that 109 are attributable to causes under control of the companies. And then, again, Table XIII shews that 35, or 32·1 per cent., were occasioned by "running off the "line." So far as the management of railways is concerned in preserving the lives of passengers, this class of accidents is second in importance only to that arising from collisions. In fact, "collisions" and "running off the line" caused 91 per cent. of all the deaths of passengers for which the companies can be supposed responsible; and therefore, a thorough analysis of these two classes of accidents will complete the inquiry so far as the lives of passengers are concerned.

In the following Table, XXVIII, will be found the results of the investigation made into the immediate causes of engines, trains, and other parts of trains running off the line. The analysis will be found sufficiently minute and detailed for every useful purpose.

Of 156 cases of "running off the line," the immediate cause has been ascertained in 105 instances. And it is also found, that 105 of the accidents have been attended with injury to life and limb of passengers, and 51 resulted without any injury.

It will immediately appear on examination of Section A of the same Table, as was remarked in regard to the similar section of the Tables of collisions, that it is impossible to hold the companies responsible for every one of this group of accidents. They are so clearly due to causes difficult to be foreseen, that they may for the present be passed over as such.

But in regard to Section B, which includes none but cases of running off the line from the breaking of machinery, there can be no doubt that greater precautions might

Table XXVIII.

An Analysis of the Causes of Engines, Trains, or Parts of Trains, running off the Rails, on Railways in Great Britain and Ireland; from the Year 1844 to the Year 1852, inclusive.

Year.	A Weather.				B Machinery Breaking.														Defects in Permanent Way.								D Obstructions on Road.				E	F	G	Total Number in each Year.
	Floods or Damage caused thereby.		Ballast washed away by heavy Rain.		Engines.								Tenders.		Carriages and Trucks.				Points or Switches Open, Defective, or Unattended to.		Rail-Joints, Sprung Rail, or Rails out of Guage &c.		Rails broken or torn up.		Line under Repair.		Bridge sunk, or gave way.		Bad State of Road in general.		Left, or Fallen on Line.		Placed on Maliciously.		Contact with Cattle.		Reckless Driving, or Excessive Speed.	Miscellaneous.	Cause not ascertained.	
					Axles.				Wheels.		Crank.	Connecting Rod.	Other Accidents.																						
					Leading.		Other.		Leading.																											
	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	Not resulting in Injury.	Resulting in Injury.	
	Number of Accidents.		Number of Accidents.		Number of Accidents.		Number of Accidents.		Number of Accidents.		Number of Accidents.	Number of Accidents.	Number of Accidents.		Number of Accidents.		Number of Accidents.		Number of Accidents.		Number of Accidents.		Number of Accidents.		Number of Accidents.		Number of Accidents.		Number of Accidents.		Number of Accidents.		Number of Accidents.		Number of Accidents.		Number of Accidents.		
1844	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	1	1	1	..	..	..	..	..	..	..	..	..	1	1	..	1	..	..	10
1845	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	1	..	3	..	..	..	1	1	..	..	..	..	2	..	1	1	..	..	1	2	15
1846	..	..	..	1	1	..	1	..	1	..	..	..	1	..	1	..	1	2	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..	1	4	23
1847	..	..	..	1	1	..	2	1	..	..	1	..	1	..	1	..	1	2	2	1	1	1	1	..	1	..	..	..	1	..	..	..	..	..	1	2	..	6	31
1848	..	..	2	..	..	..	..	..	2	..	1	..	1	..	..	..	..	1	1	1	..	..	1	..	..	..	1	..	2	..	..	..	1	..	..	..	5	6	22
1849	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	3	10
1850	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	2	1	..	..	..	..	..	..	2	..	..	..	..	..	1	4	14
1851	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	1	7	16
1852	..	1	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	9	15
Totals	1	2	..	2	2	1	1	2	4	2	..	3	1	4	..	2	..	1	1	2	3	5	6	6	6	2	6	4	1	2	1	..	1	..	1	4	6	..	2	3	1	..	4	1	3	10	41	156

generally be taken. The remarks offered on the "breaking of machinery," as the immediate cause of collisions, apply with equal force in this instance, and need not again be repeated; but it is certainly to be lamented that, of the 105 ascertained cases of "running off the line," no less than 43 should be due to the "breaking of machinery." Frequent inspection by competent parties is the protection against this group of accidents: and strong measures should be enforced to secure the safety arising from this sort of supervision.

The accidents arising from the causes recorded in Section C are certainly, at least to a very great extent, preventable. Nothing but the most culpable indifference to the public safety can permit a continuance of this group of accidents, which forms upwards of 28 per cent. of all the classified accidents in the Table.

The accidents included in Columns 2 and 3 of Section D, cannot in general be attributable to negligence of the companies.

The four cases in Section E are due to reckless driving.

Sections B and C of this Table should be well considered by railway directors.

The next, Table XXIX, will shew how the various groups of accidents of "running "off the line" affected life and limb of passengers.

What is strange in the record of accidents contained in this Table is, that the 51 cases, included in Sections A and B, did not occasion a single death of a passenger, while the 30 in Section C, attributable to defects in the "permanent way," produced eight deaths of passengers.

The number of deaths of passengers from obstructions on the line was three, but no passenger lost his life under Section E, through reckless driving, or excessive speed.

The miscellaneous group, Section F, it will be seen, includes 55, or upwards of one-third of all the cases of trains running off the rails, to which unascertained causes nearly one-half of the whole deaths of passengers from running off the line is due. But the returns of the railway department were either defective as to these cases, or the accidents themselves were of so peculiar a kind as not to admit of a satisfactory classification.

When that part of the subject, which has reference to the manner in which railway accidents have affected the employés, is considered, the effects of trains running off the line will be more fully discussed. From Tables XXIV and XXVI, preceding, it will be observed that collisions killed an equal number of employés and passengers; but the cases of running off the line have relatively, as will be seen by the last columns of Table XXIX, a much more fatal effect on the servants of the companies.

Table XXIX.

Shewing the Number of Deaths and Injuries, to Railway Employés and to Passengers, due to each Cause of Trains, or Parts of Trains, or Engines running off the Rails of Railways in Great Britain and Ireland, from 1844 *to* 1852.

	A. Weather.					B. Machinery Breaking. a. Engines.					B. b. Tenders.					B. c. Carriages, or Trucks, &c.					B. d. Totals.				
	No. of Accidents.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	No. of Accidents.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	No. of Accidents.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	No. of Accidents.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	No. of Accidents.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.
1844	..	..	..	..	..	1	1	1	..	..	1	..	..	..	2	1	..	..	..	..	3	1	1	..	2
1845	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	1	..	..	..	1	3	..	..	..	1
1846	2	..	2	..	..	5	1	3	..	1	1	..	1	..	..	4	1	3	..	13	10	2	7	..	14
1847	1	..	..	..	..	6	2	3	..	..	1	..	..	..	..	4	2	..	..	..	11	4	3	..	..
1848	2	1	2	..	4	4	1	3	..	5	..	..	..	..	..	1	..	..	..	..	5	1	3	..	5
1849	2	..	1	..	..	1	..	..	..	..	..	..	..	..	..	2	..	..	..	16	3	..	..	..	16
1850	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	2	..	1	..	2	3	..	1	..	2
1851	..	..	..	..	..	1	1	1	..	..	1	..	..	..	..	1	2	..	..	..	3	3	1	..	..
1852	1	..	2	..	..	2	3	2	..	..	..	..	..	..	..	..	..	..	..	..	2	3	2	..	..
Totals	8	1	7	..	4	23	9	13	..	6	4	..	1	..	2	16	5	4	..	32	43	14	18	..	40

	C. Defects in Permanent Way. a. Rails, Points, and Switches.					C. b. Bad Road, or under Repair.					C. c. Totals.					D. Obstructions on Line. a. On or between Rails.					D. b. Contact with Cattle.					D. c. Totals.					E. Reckless Driving, or Excessive Speed.					F. Miscellaneous, and not ascertained.					Grand Total.				
	No. of Accidents.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	No. of Accidents.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	No. of Accidents.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	No. of Accidents.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	No. of Accidents.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	No. of Accidents.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	No. of Accidents.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.	No. of Accidents.	Kilied.	Injured.	Killed.	Injured.	No. of Accidents.	Emp. Killed.	Emp. Injured.	Pass. Killed.	Pass. Injured.
1844	3	..	2	..	..	..	..	..	..	..	3	..	2	..	..	1	2	..	..	..	2	1	..	..	..	3	3	..	..	..	1	..	..	..	1	..	..	..	..	..	10	4	3	..	3
1845	3	..	5	..	5	2	1	..	..	..	5	1	5	..	5	3	..	3	..	6	1	..	..	..	..	4	..	3	..	6	..	..	..	..	..	3	3	6	..	..	15	4	14	..	12
1846	2	..	..	..	..	1	1	1	..	2	3	1	1	..	2	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	2	1	..	..	5	1	4	..	1	23	6	15	..	17
1847	6	2	2	..	..	2	..	..	2	1	8	2	2	2	1	2	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	9	3	8	3	17	31	9	13	5	18
1848	3	..	2	..	..	..	..	..	..	..	3	..	2	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	11	5	5	2	3	22	7	12	2	12
1849	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	4	4	..	5	1	10	4	1	5	18
1850	4	..	..	..	6	..	..	..	..	..	4	..	..	..	6	2	..	2	..	1	..	..	..	..	..	2	..	2	..	1	..	..	..	..	..	5	..	1	..	9	14	..	4	..	18
1851	3	..	..	6	23	..	..	..	..	..	3	..	..	6	23	2	2	..	3	3	..	..	..	..	..	2	2	..	3	3	..	..	..	..	..	8	3	4	..	22	16	8	5	9	48
1852	1	..	..	..	2	..	..	..	..	..	1	..	..	..	2	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	10	7	7	..	15	15	10	11	..	17
Totals	25	2	11	6	36	5	2	1	2	3	30	4	12	8	39	12	4	5	3	10	4	1	..	..	..	16	5	5	3	10	4	2	1	..	2	55	26	35	10	68	156	52	78	21	163

Column A contains all those Accidents which were not under the Company's control. Column C*a* includes cases of *neglect* in leaving points open, the effect on the train being manifestly the same whether they were left open, or were defective, &c.

Table XXX.

Shewing the number of Accidents, by Trains running off the Line, unattended and attended with Injury, in each year, from 1844 *to* 1852, *inclusive, occurring to each species of Train, with the Number of Employés and Passengers Killed and Injured thereby.*

Year.	Express.						Mail.						All other Passenger Trains.						Engines.					
	Number of Accidents.		Emp.		Pass.		Number of Accidents.		Emp.		Pass.		Number of Accidents.		Emp.		Pass.		Number of Accidents.		Emp.		Pass.	
	Not resulting in Injury.	Resulting in Injury.	Killed.	Injured.	Killed.	Injured.	Not resulting in Injury.	Resulting in Injury.	Killed.	Injured.	Killed.	Injured.	Not resulting in Injury.	Resulting in Injury.	Killed.	Injured.	Killed.	Injured.	Not resulting in Injury.	Resulting in Injury.	Killed.	Injured.	Killed.	Injured.
1844	..	..	..	..	..	..	..	..	..	..	..	..	4	4	2	2	..	3	..	..	..	..	..	..
1845	..	2	..	3	..	9	1	..	..	..	..	..	2	6	3	5	..	3	1	..	..	..	..	..
1846	..	2	1	1	..	..	..	..	..	..	..	..	3	9	1	8	..	17	..	..	..	..	..	..
1847	1	3	1	2	2	1	..	..	..	..	..	..	7	10	5	10	3	17	..	1	..	1	..	..
1848	1	3	..	2	2	1	2	1	..	1	..	..	3	4	4	6	..	11	2	1	1	1	..	..
1849	..	1	2	..	..	..	1	1	..	..	5	1	1	3	..	..	..	17	1	1	..	1	..	..
1850	..	1	..	..	..	1	..	..	..	..	..	..	3	7	..	1	..	17	..	..	..	..	..	..
1851	..	..	..	..	..	..	..	..	..	..	..	..	3	9	3	4	9	48	..	1	1	1	..	..
1852	..	4	4	2	..	3	..	1	2	2	..	..	1	7	4	4	..	14	..	1	..	1	..	..
Totals	2	16	8	10	4	15	4	3	2	3	5	1	27	59	22	40	12	147	4	5	2	5	..	..

Year.	Goods, &c., Trains.						Trains not specified.						Totals.					
	Number of Accidents.		Emp.		Pass.		Number of Accidents.		Emp.		Pass.		Number of Accidents.		Emp.		Pass.	
	Not resulting in Injury.	Resulting in Injury.	Killed.	Injured.	Killed.	Injured.	Not resulting in Injury.	Resulting in Injury.	Killed.	Injured.	Killed.	Injured.	Not resulting in Injury.	Resulting in Injury.	Killed.	Injured.	Killed.	Injured.
1844	..	2	2	1	..	..	..	..	..	..	..	..	4	6	4	3	..	3
1845	1	1	1	4	..	..	..	1	..	2	..	..	5	10	4	14	..	12
1846	4	3	2	5	..	..	..	2	2	1	..	..	7	16	6	15	..	17
1847	3	2	3	..	..	..	4	..	..	..	..	..	15	16	9	13	5	18
1848	2	2	2	..	..	..	..	1	..	2	..	..	10	12	7	12	2	12
1849	..	..	..	..	..	..	..	1	2	..	..	..	3	7	4	1	5	18
1850	1	2	..	3	..	..	..	..	..	..	..	..	4	10	..	4	..	18
1851	..	3	4	..	..	..	..	..	..	..	..	..	3	13	8	5	9	48
1852	..	..	..	..	..	..	..	1	..	2	..	..	1	14	10	11	..	17
Totals	11	15	14	13	..	..	4	6	4	7	..	..	52	104	52	78	21	163

In the preceding Table, XXX, will be seen in what manner the different kind of trains were affected by the class of accidents now under consideration.

It was found in Table XXV that the passengers by "express" trains suffered less from the collisions which occurred, than the passengers by other trains. But in regard to the class of accidents in the preceding Table, the case is very different; for, from the 18 cases of "running off the line" by express trains, 4 deaths of passengers happened, while from the 93 cases taking place among "mail" and other passenger trains, the number of deaths was 17. In regard, however, to injuries only, the ratio was also less in the case of "express" trains.

The preceding portion of this paper has been confined chiefly to an examination of the manner in which railway accidents have affected passengers, although the Tables themselves contain the results of the analysis for employés and other persons not passengers for the time being: it now remains to investigate the manner in which railway accidents have affected railway servants, and other persons not passengers.

Although the general public is naturally most alive to the manner in which passengers suffer from accidents, still every earnest inquirer must at once sympathize with the dreadful amount of accidents and fearful loss of life to which the servants of railway companies are exposed. It is quite impossible not to regard this latter branch of the inquiry as really the more grave and important of the two. Table XII shews that while in the twelve years ending 1852 the loss of life amongst passengers was 266, 1081 deaths took place amongst the employés. This statement is of itself sufficient to prevent the remaining portion of this paper from being regarded with indifference.

Some difficulty was experienced in the treatment of the succeeding part of this inquiry, owing to the obscurity which obtained as to the precise number of persons employed in different departments of the railway service during the earlier years to which the investigation relates. Since 1848, however, several parliamentary returns afford the means of making a near approximation to the number of persons employed in the different departments, and hence offer a ready means by which to determine the numbers constantly exposed to the risk of accidents.

From the data in the following Table, XXXI, these numbers are easily deduced.

The returns which furnish the data for the last two columns of this Table were issued subsequently to the preparation of the principal part of this paper; but it will be found that the principle on which the Table has been constructed produces results almost identical for practical purposes with those given in the parliamentary returns themselves.

Table XXXII exhibits the number of employés of different descriptions exposed continuously to the risk of accidents. The principle on which it has been constructed from the data contained in Table XXXI is obvious.

[By the aid

Table XXXI.

Number and Description of Persons Employed on all Railways open for Traffic in Great Britain and Ireland.

Class of Persons.	On 1st May, 1848.	On 30th June, 1848.	On 30th June, 1849.	On 30th June, 1850.	On 30th June, 1851.	On 31st Dec., 1851.	Total from 30th June, 1848, to 31st Dec., 1851.	On 30th June, 1852.	On 30th June, 1853.
Superior Officers (*g*)	6,298	6,468*	7,490	8,298†	9,106	9,510‡	28,330§	8,702	9,949
Engine-men, or Drivers	1,752	1,764	1,839	2,049	2,258	2,363	7,080	2,397	2,821
Assistant Engine-men, or Stokers . .	1,809	1,818	1,871	2,129	2,387	2,516	7,360	2,460	2,869
Conductors, or Guards	1,496	1,515	1,631	1,941	2,252	2,407	6,660	2,257	2,641
Artificers (*a*)	10,814	10,813	10,809	11,636	12,463	12,876	40,521	13,878	15,624
Switchmen (*b*)	1,058	1,127	1,540	1,703	1,865	1,946	5,711	1,605	2,223
Policemen (*c*)	2,475	2,337	1,508	1,553	1,599	1,622	5,841	1,567	1,542
Porters and Messengers	7,559	7,656	8,238	9,007	9,776	10,160	31,041	10,434	12,188
Plate-layers (*d*)	4,391	4,551	5,508	5,557	5,605	5,629	18,957	4,909	6,033
Labourers (*e*)	14,438	14,380	14,029	14,419	14,810	15,005	50,551	13,682	18,987
Miscellaneous (*f*)	598	728	1,505	1,474	1,442	1,426	4,777	2,626	2,069
$a+b+c+d+e+f+g$ and others.	40,072	40,403	42,389	44,639	46,890	48,015	154,682	50,053	59,890

The figures of the 3rd, 5th, and 7th columns are thus derived, viz. :—

* As 14 months (1st May, 1848, to 30th June, 1849,) : 1,192 = {7,490—6,298 or increase in that time} : : 2 months (1st May, 1848, to 30th June, 1848,) : increase in that time = 170. Then 6,298 + 170 = 6,468.

† $8{,}298 = \frac{7{,}490 + 9{,}106}{2}$.

‡ As 24 months (30th June, 1849, to 30th June, 1851,) : 1,616 = (increase) : : 6 months (30th June, 1851, to 31st Dec., 1851,) : increase = 404. Then 9,106 + 404 = 9,510.

§ See Table XXXII. (Note †).

Table XXXII.

Number and Description of Railway Company's Servants exposed to Risk from 30th June, 1848, to 31st December, 1851.

Years.	(*g*) Superior Officers.	Engine Drivers.	Stokers.	Guards.	(*a*) Artificers.	(*b*) Switch-men.	(*c*) Police-men.	Porters.	(*d*) Plate-layers.	(*e*) Labourers.	(*f*) Miscel-laneous.	*a*+*b*+*c*+*d*+*e*+*f*+*g* "Other Servants."	Totals.
30th June, 1848, to 30th June, 1849	6,979†	1,801½	1,844½	1,573	10,811	1,333½	1,922½	7,947	5,029½	14,209½	1,116½	41,396	95,963½
30th June, 1849, to 30th June, 1850	7,894	1,943¾	2,000	1,786¼	11,222½	1,621¼	1,530¾	8,622½	5,532¼	14,224½	1,489¾	43,514¼	101,381½
30th June, 1850, to 30th June, 1851	8,702	2,153¼	2,258	2,096¾	12,049½	1,783¾	1,576¼	9,391½	5,580¾	14,614¾	1,457¾	45,764¾	107,429
30th June, 1851, to 31st Dec., 1851	4,755	1,181½	1,258	1,203½	6,438	973	811	5,080	2,814½	7,502½	713	24,007½	56,737½
(Col. 8, Table XXXI.) Totals—3½ years ...	28,330†	7,080	7,360½	6,659½	40,521	5,711½	5,840½	31,041	18,957	50,551	4,777	154,682½	361,511½

The numbers in this Table are thus obtained (see Table XXXI):—

† Average number from 30th June, 1848, to 30th June, 1849, $= \frac{6,468 + 7,490}{2} = 6,979$

... ... 1849, ... 1850, $= \frac{7,490 + 8,298}{2} = 7,894$

... ... 1850, ... 1851, $= \frac{8,298 + 9,106}{2} = 8,702$

... 30th June, to 31st December, 1851, $= \frac{9,106 + 9,914^*}{4} = 4,755$

Total 28,330

* 9,914, number employed at end of year (from 30th June).
For, increase in half-year = (9,510 — 9,106) = 404,
∴ ... whole year = 808.

Table XXXIII.

Number and Description of Employés exposed to Risk in the undermentioned Years.

Date.	1. Superior Officers. (*g*)	2. Engine Men.	3. Stokers.	4. Guards.	5. Artificers. (*a*)	6. Switchmen. (*b*)	7. Policemen. (*c*)	8. Porters.	9. Plate-layers. (*d*)	10. Labourers. (*e*)	11. Miscellaneous. (*f*)	12. *a*+*b*+*c*+*d*+*e*+*f*+*g*.
Last 5 months of 1840	824	208	216	193	1,201	164	184	911	558	1,515	135	4,581
Year 1841 . . .	2,243	566	587	525	3,270	446	501	2,480	1,518	4,122	368	12,468
... 1842 . . .	2,449	618	641	573	3,570	487	547	2,708	1,657	4,501	402	13,613
... 1843 . . .	2,588	659	683	611	3,805	519	583	2,886	1,766	4,797	429	14,487
Total . .	8,104	2,051	2,127	1,902	11,846	1,616	1,815	8,985	5,499	14,935	1,334	45,149
Year 1844 . . .	2,787	709	735	653	4,096	559	627	3,107	1,901	5,163	461	15,593
... 1845 . . .	3,211	809	845	751	4,681	638	716	3,550	2,173	5,901	527	17,847
... 1846 . . .	3,677	928	962	860	5,273	731	820	4,065	2,488	6,757	604	20,350
... 1847 . . .	4,807	1,212	1,258	1,125	7,008	956	1,073	5,315	3,253	8,835	789	26,721
Total . .	14,482	3,658	3,800	3,394	21,058	2,884	3,236	16,037	9,815	26,656	2,381	80,511
Year 1848 . . .	6,468	1,764	1,818	1,515	10,813	1,127	2,337	7,656	4,551	14,380	728	40,404
... 1849 . . .	7,490	1,839	1,871	1,631	10,809	1,540	1,508	8,238	5,508	14,029	1,505	42,389
... 1850 . . .	8,298	2,049	2,129	1,941	11,636	1,703	1,553	9,007	5,557	14,419	1,474	44,640
... 1851 . . .	9,106	2,258	2,387	2,252	12,463	1,865	1,599	9,776	5,605	14,810	1,442	46,890
Total . .	31,362	7,910	8,205	7,339	45,721	6,235	6,997	34,677	21,221	57,638	5,149	174,323
Total of 3 periods	53,948	13,619	14,132	12,635	78,625	10,735	12,048	59,699	36,535	99,229	8,864	299,983
Year 1852 . .	9,609	2,446	2,537	2,269	14,136	1,928	2,163	10,722	6,561	17,827	1,592	53,897
Grand Total	63,557	16,065	16,669	14,904	92,761	12,663	14,211	70,421	43,096	117,056	10,456	353,880

Table XXXIV.

Shewing the Per-Centage of Deaths and Injuries amongst each class of Railway Employés during the last Five Months of 1840, *and during each Year down to* 1853.

Year.	Engine Drivers.					Stokers.					Guards.					Porters.					Other Servants.				
	Number Exposed.	Killed.	Injured.	Per-Centage of Deaths.	Per-Centage of Injuries.	Number Exposed.	Killed.	Injured.	Per-Centage of Deaths.	Per-Centage of Injuries.	Number Exposed.	Killed.	Injured.	Per-Centage of Deaths.	Per-Centage of Injuries.	Number Exposed.	Killed.	Injured.	Per-Centage of Deaths.	Per-Centage of Injuries.	Number Exposed.	Killed.	Injured.	Per-Centage of Deaths.	Per-Centage of Injuries.
1840	208	1	6	·481	2·885	216	1	5	·463	2·315	193	..	2	..	1·036	911	1	..	·110	..	4,581	12	8	·262	·175
1841	566	1	4	·177	·707	587	..	4	..	·682	525	1	5	·190	·952	2,480	4	3	·161	·121	12,468	23	18	·184	·144
1842	618	2	4	·324	·647	641	4	5	·624	·780	573	7	2	1·222	·349	2,708	3	2	·111	·074	13,613	27	22	·198	·162
1843	659	3	4	·455	·607	683	2	5	·293	·732	611	5	2	·818	·327	2,886	8	4	·277	·139	14,487	21	13	·145	·090
	2,051	7	18	·341	·878	2,127	7	19	·329	·893	1,902	13	11	·683	·578	8,985	16	9	·178	·100	45,149	83	61	·184	·135
1844	709	7	6	·989	·846	735	6	12	·816	1·633	658	5	6	·760	·912	3,107	6	4	·193	·129	15,593	28	17	·180	·109
1845	809	3	5	·371	·618	845	7	8	·828	·947	751	6	7	·799	·933	3,550	6	2	·169	·056	17,847	36	23	·202	·129
1846	928	7	14	·754	1·509	962	7	11	·163	1·144	860	9	9	1·046	1·046	4,065	7	7	·172	·172	20,350	61	35	·300	·172
1847	1,212	11	6	·916	·495	1,258	22	17	1·749	1·351	1,125	10	9	·889	·800	5,315	12	4	·226	·075	26,721	67	31	·251	·116
	3,658	28	31	·765	·847	3,800	42	48	1·105	1·263	3,394	30	31	·884	·913	16,037	31	17	·193	·106	80,511	192	106	·238	·131
1848	1,764	6	11	·340	·624	1,818	14	14	·770	·770	1,515	22	10	1·452	·660	7,656	10	6	·131	·078	40,404	86	33	·213	·082
1849	1,839	6	8	·326	·435	1,871	13	7	·695	·374	1,631	15	14	·920	·858	8,238	13	8	·158	·097	42,389	82	41	·193	·097
1850	2,049	4	11	·195	·536	2,129	16	8	·752	·376	1,941	21	15	1·082	·773	9,007	9	5	·100	·056	44,640	79	22	·177	·049
1851	2,258	11	5	·487	·221	2,387	6	10	·251	·418	2,252	14	3	·622	·133	9,776	19	11	·194	·113	46,890	63	21	·134	·045
	7,910	27	35	·341	·442	8,205	49	39	·597	·475	7,339	72	42	·981	·572	34,677	51	30	·147	·086	174,323	310	117	·178	·067
1852	2,446	11	10	·449	·409	2,537	18	17	·709	·670	2,269	12	16	·529	·705	10,722	19	9	·177	·084	53,897	63	37	·117	·069
1840 to 1851	13,619	62	84	·455	·617	14,132	98	106	·693	·705	12,635	115	84	·910	·665	59,699	98	56	·164	·094	299,983	585	284	·195	·095
1840 to 1852	16,065	73	94	·454	·585	16,669	116	123	·695	·738	14,904	127	100	·852	·671	70,421	117	65	·166	·092	353,880	648	321	·183	·091

Table XXXV.

Number and Ratio of Deaths and Injuries from all Causes among Employés.

Period.	Engine Drivers.			Ratios.	
	Number.	Killed.	Injured.	One Killed in	One Injured in
7th August 1840 to 1843	2,051	7	18	293	114
... 1844 ... 1847	3,658	28	31	131	118
... 1848 ... 1851	7,910	27	35	293	226
... 1840 ... 1851	13,619	62	84	220	162
... 1852	2,446	11	10	222	245
Grand Total	16,065	73	94	220	171

Period.	Stokers.			Ratios.	
	Number.	Killed.	Injured.	One Killed in	One Injured in
7th August 1840 to 1843	2,127	7	19	304	112
... 1844 ... 1848	3,800	42	48	90	79
... 1848 ... 1851	8,205	49	39	168	210
... 1840 ... 1851	14,132	98	106	144	133
... 1852	2,537	18	17	141	149
Grand Total	16,669	116	123	144	136

Period.	Guards.			Ratios.	
	Number.	Killed.	Injured.	One Killed in	One Injured in
7th August 1840 to 1843	1,902	13	11	146	173
... 1844 ... 1847	3,394	30	31	113	109
... 1848 ... 1851	7,339	72	42	102	175
... 1840 ... 1851	12,635	115	84	110	150
... 1852	2,269	12	16	189	142
Grand Total	14,904	127	100	117	149

Period.	Porters.			Ratios.	
	Number.	Killed.	Injured.	One Killed in	One Injured in
7th August 1840 to 1843	8,985	16	9	562	998
... 1844 ... 1847	16,037	31	17	517	943
... 1848 ... 1851	34,677	51	30	680	1,156
... 1840 ... 1851	59,699	98	56	609	1,066
... 1852	10,722	19	9	564	1,191
Grand Total	70,421	117	65	602	1,083

Period.	Other Servants.			Ratios.	
	Number.	Killed.	Injured.	One Killed in	One Injured in
7th August 1840 to 1843	45,149	83	61	544	740
... 1844 ... 1847	80,511	192	106	419	760
... 1848 ... 1851	174,323	310	117	562	1,490
... 1840 to 1851	299,983	585	284	513	1,056
... 1852	53,897	63	37	856	1,457
Grand Total	353,880	648	321	546	1,102

By the aid of Tables XXXI and XXXII, Table XXXIII has been calculated, so as to shew for precisely the same periods of time to which the data given in the early part of this paper relate, the number of employés exposed to risk; thus placing the different elements entering into the inquiry in a fitting shape to determine the relation of the one to the other. The mode by which these figures have been obtained from Tables XXXI and XXXII, will be at once understood on a careful perusal. Table XXXIII will be found exceedingly useful for future reference by those giving attention to the economics of our railway system generally, as well as to those who may direct their attention to the special object of this inquiry.

Table XXXIV completes the principal series of elementary facts which enter into the present part of this investigation. The details as to deaths and injuries will be found in Table XII, page 246 *ante;* and those in regard to the numbers exposed to the risks of accident will be found, as already stated, in Tables XXXI, XXXII, and XXXIII, preceding.

It will frequently be necessary to refer to the facts set forth in Table XXXIV; but, for the immediate purpose of determining the ratio of deaths and injuries from all causes or kinds of railway accidents amongst employés, compared with the ratio found to prevail amongst passengers, Table XXXV will be convenient; from which it will be seen that the ratio of deaths per annum amongst different classes of employés for the whole period of years, now under consideration, has been as follows, viz.:—

The ratio of deaths per annum among		Engine-Drivers	=	1 in 220
...	...	Stokers	=	... 144
...	...	Guards	=	... 117
...	...	Porters	=	... 602
...	...	Other Servants	=	... 546

It is thus evident that, for the whole period from 1840-52, the ratio of deaths has been, amongst the first three classes of servants, least in the group engine-drivers, and highest in that of guards. A similar result appeared also in Table XXXIV. This relation, however, of the mortality from accidents has not been uniformly maintained by the same three classes throughout the whole of the period under observation, as will be seen by a comparison of the mortality of stokers with that of guards for the period 1844–48. The mortality of the fourth and fifth groups of employés differs widely from that of the other three groups; and the same remark is applicable to the ratio of injuries in the same groups.

The ratio of injuries being		among Engine-Drivers	=	1 in 171
...	...	Stokers	=	... 136
...	...	Guards	=	... 149
...	...	Porters	=	... 1,083
...	...	Other Servants	=	... 1,102

In respect to deaths, the ratio for stokers was intermediate between that for engine-drivers and guards; but so far as injuries are concerned, the ratio for stokers is higher than that for either guards or engine-drivers.

It will assist the object of this inquiry to consider the facts of the preceding Table, as given in the following condensed summary:—

Abstract N.

Period.	Engine Drivers, Stokers, and Guards.			Ratios.	
	Number.	Killed.	Injured.	One Killed in	One Injured in
1840 to 1843	6,080	27	48	229	129
1844 ... 1847	10,852	100	110	109	99
1848 ... 1851	23,454	148	116	158	200
1840 to 1851	40,386	275	274	147	148
1852	7,252	41	43	177	169
Grand Total	47,638	316	317	151	150

Period.	Porters and Other Servants.			Ratios.	
	Number.	Killed.	Injured.	One Killed in	One Injured in
1840 to 1843	54,134	99	70	547	773
1844 ... 1847	96,548	223	123	433	785
1848 ... 1851	209,000	361	147	579	1,422
1840 to 1851	359,682	683	340	527	1,058
1852	64,619	82	46	788	1,405
Grand Total	424,301	765	386	555	1,099

This Abstract presents facts of a very remarkable nature when compared with those given in Abstract H, page 247 *ante*. In the preceding Abstract, it will be seen that, in the first group of employés, consisting of engine-drivers, stokers, and guards, the numbers of injuries and deaths are almost identical, while amongst passengers (see Abstract O) the ratio of injured to killed was 675·20 per cent.

In regard, however, to the group consisting of porters and other servants, the number killed has been 1 in 555, and the number injured has been 1 in 1,099; or the ratio of injured to killed about 50·46 per cent.

In this way of looking at the question, some results are disclosed, which merit very serious consideration.

Abstract O.

Class.	Numbers.		Ratio of Injured to Killed.
	Killed.	Injured.	
Engine Drivers, Stokers, and Guards	316	317	About equal
Porters and Other Servants	765	386	50·46 per cent.
Passengers	266	1,796	675·20 ...

There appears in this Abstract a very curious law, but one which, on reflection, is quite consistent with the circumstances known to influence the risk to which each class of persons is exposed. By viewing, in connection with the preceding results, some of the facts set forth in Abstract O, the following conclusions are arrived at:—

ABSTRACT P.

Class of Persons exposed to Risk.	Numbers.		Ratio of the Injured to Killed.
	Killed.	Injured.	
Trespassers	306	84	27·45 per cent.
Public by their own negligence	175	65	37·14 ...
Other Servants	648	321	49·54 ...
Porters and other Servants	765	386	50·46 ...
Porters	117	65	55·56 ...
Engine-Drivers, Stokers, and Guards	316	317	About equal
Passengers	266	1,796	675·20 ...

A very slight consideration of the nature of the circumstances, under which the accidents take place in each of the above classes, will at once explain the great disparity between the ratio of the killed and injured. If the different circumstances in which the two classes of trespassers and passengers be contrasted, it will at once appear that, in the event of an accident occurring, the chances of its proving fatal differ widely in the two groups; the former being injured principally by trains overtaking them while in motion, and consequently the probability of the accident proving fatal is very great; but, in regard to the latter, it has been shewn in Table IV, that the bulk of accidents to passengers take place under circumstances of a much less violent nature, in which the tendency to be fatal is quite inconsiderable compared with the accidents to which trespassers are liable. Of the 297 fatal accidents by defined causes to trespassers recorded in Table VI, no less than 268 are assignable to the cause "run over;" while, of the 228 fatal accidents to passengers, 99, or 43·42 per cent., have been occasioned by collisions of trains, and trains running off the line. Accidents of this kind, it will be found, are of a less violent nature than any other, and have, therefore, less tendency to be fatal; and if these facts be kept distinctly in view, the great disparity in the relative fatality of accidents in different classes, as shewn in Abstract P, will be readily understood. The following illustration of the tendency of different classes of accidents to prove fatal, so far as passengers are concerned, may be interesting and instructive on this point of the inquiry:—

ABSTRACT Q.

Ratio amongst Passengers of Injured to Killed from different causes.

Causes.	Killed.	Injured.	Ratio of Injured to Killed.
Collisions, running off line, and collision at stations	99	1,505	1520·20 per cent.
All other defined causes	129	230	178·29 ...

Accidents from the last group of causes, it will be seen, are of a much more fatal character than those in the first group; and an inspection of the causes, included in the last of the above groups, will shew that they are of a kind more in common with those which affect railway servants in general, than the causes contained in the first group; and hence the explanation of the disparity exhibited in Abstract P preceding.

Abstract R gives a succinct view of the liability of different classes of persons to be injured by accidents from various causes, and also the chances of those accidents proving fatal; and it will be seen, that, in the following classes, the great bulk of the accidents take place under circumstances in which the cause of injury is of a very violent nature, and can, with few exceptions, be scarcely otherwise than fatal:—

Of all the deaths amongst	Trespassers	90·24 per cent.	Have occurred from being run over by trains.
	Public by their own negligence	88·66 ...	
	Other Servants	61·50 ...	
	Porters	30 39 ...	

Again, it will be seen, that, in the following classes of the accidents also taking place under circumstances likely to be fatal:—

Of the deaths among	Engine-Drivers	46·03 per cent.	Are caused by "Running off the Line" and "Falling from Train."
... ...	Stokers . .	52·96 ...	"Running off Line," "Falling from Train," and "Crushed."
... ...	Guards . .	82·21 ...	"Falling from Train," "Mounting Train in Motion," "Run over," and "Crushed."
... ...	Porters . .	70·58 ...	"Run over" and "Crushed."

These facts are sufficient to account for the tendency of different kinds of accidents, as they affect different classes of persons, to prove fatal. In Abstract Q, it will be found, that accidents to passengers from "collisions," "running off the line," and "collisions at stations," were much less fatal than those taking place from other causes; so also will it be found that, amongst the three important classes of railway servants, engine-drivers, stokers, and guards, the accidents from the same three causes are much less fatal than those from other causes.

Abstract R.

Number of Deaths from each cause amongst different classes, also the Ratio of Deaths from each cause to the Total Deaths from all causes for the whole period, 1840-52.

Cause.	Passengers.		Public by their own Negligence.		Trespassers.		Engine-Drivers.		Stokers.		Guards.		Porters.		Other Servants.	
	Number Killed.	Ratio.	Number Killed.	Ratio.	Number Killed.	Ratio.	Number Killed.	Ratio.	Number Killed.	Ratio.	Number Killed.	Ratio.	Number Killed.	Ratio.	Number Killed.	Ratio.
Collision	29	12·72	...	...	...	...	6	9·52	8	7·92	3	3·34	...	...	11	1·92
Off line	35	15·35	...	...	...	...	19	30·16	13	12·87	6	6·67	1	·98	6	1·05
Running into station	5	2·20	...	..	...	...	1	1·59	...	...	...	...	...	...	...	...
Axle breaking	6	2·63	...	...	...	...	...	...	...	...	...	...	...	...	4	·70
Machinery breaking	2	·88	...	...	1	·34	7	11·11	11	10·89	1	1·11	...	...	5	·86
Falling from train	16	7·02	6	4·00	8	2·69	10	15·87	28	27·72	37	41·11	10	9·80	56	9·76
Jumping from train	34	14·91	4	2·67	1	·33	3	4·76	5	4·95	2	2·22	6	5·89	24	4·18
Run over	22	9·65	133	88·66	268	90·24	4	6·35	11	10·89	13	14·44	31	30·39	353	61·50
Collision at station	35	15·35	...	...	...	...	6	9·53	5	4·95	4	4·45	4	3·92	8	1·39
Mounting train in motion	39	17·10	3	2·00	10	3·37	4	6·35	7	6·94	10	11·11	9	8·83	35	6·10
Crushed	5	2·19	4	2·67	9	3·03	3	4·76	13	12·87	14	15·55	41	40·19	72	12·54
Total	228	100·00	150	100·00	297	100·00	63	100·00	101	100·00	90	100·00	102	100·00	574	100·00
Miscellaneous	38	...	25	...	9	...	10	...	15	...	37	...	15	...	74	...

ABSTRACT S.

Ratio of Injured to Killed amongst Engine-Drivers, Stokers, and Guards, from different causes.

CAUSES.	Killed.	Injured.	Ratio of Injured to Killed.
Collisions, running off line, and Collisions at stations . .	70	118	168·57 per cent.
All other causes	246	199	80·89 ...

It is hence obvious, not only as regards employés, but also passengers, that accidents from "collisions," and from "running off the line," are neither so frequent nor so fatal as has been hitherto so generally believed by the public.

The next point connected with this part of the inquiry, to which attention is directed, is the relative frequency of fatal accidents in recent and more remote years; and, for the purpose of ascertaining how far the tendency to fatal accidents has increased or diminished amongst employés, the following Abstract has been prepared, which shews the deaths from all causes in the aggregate among

ABSTRACT T.

PERIOD.	Engine Drivers, Stokers and Guards.			Porters and other Servants.		
	Number Exposed to Risk.	Killed.	One Killed in	Number Exposed to Risk.	Killed.	One Killed in
1840 to 1843	6,080	27	225	54,134	99	547
1844 ... 1847	10,852	100	109	96,548	223	433
1848 ... 1851	23,454	148	158	209,000	361	579
1852 . . .	7,252	41	177	64,619	82	788
1840 to 1852	47,638	316	151	424,301	765	555

When a similar investigation was made into the relative frequency of fatal accidents to passengers, in Abstract H, it was most satisfactory to find so rapid and so decided a diminution of them in recent years. But, although in the present instance it would appear that, among railway servants, the mortality from accidents was not so high in the first as in the period immediately succeeding, still it is gratifying to find a still more marked and decided diminution in the rate of mortality among railway servants since the year 1844, than has taken place even amongst passengers. According to Abstract H, it will be found that the decrease in mortality of passengers, within the same period, was in the ratio of one in 230 to one in 289; while, amongst the group "Engine Drivers, Stokers, and Guards," the decrease has been in the ratio of one in 109 to one in 177; but if the ratio had been in accordance with that for passengers, it would have been as 109 to 137 only. Again, in the group "Porters and other Servants," the decrease of mortality has been as one in 433 to one in 788; but if the ratio had been the same as that for passengers, it would

have been as one in 433 to one in 544 only. It will thus be seen that the diminution of fatal accidents among the second group of railway servants is somewhat greater than in even the first group.

Few, if any persons, were, until recently, distinctly aware of the great diminution of fatal accidents amongst railway passengers; but the facts in Abstract H, of the former paper, have now sufficiently established the truth of the great improvements in this respect of railway travelling in recent years; and the evidence now brought forward in Abstract T is of a still more satisfactory and welcome nature; for while, in the period under review, the mortality of railway passengers has diminished 21 per cent., that of railway servants, taking both groups, has, in the same time, decreased no less than 78 per cent. It must hence be evident to every inquirer that great improvement in the management of the railway system of this country has taken place within the last ten years, to whatever cause that improvement may be due. The risk of life and limb has greatly diminished among all classes, whether travellers or employés.

In the former part of this paper, an ample illustration was given of the distinction intended to be drawn between accidents "beyond control of the companies" and those "under "control of the companies;" and that part of the question was sufficiently discussed, so far as passengers are concerned. It is now proposed to investigate it in relation to employés.

The following Abstract furnishes the principal facts for the period 1840–51:—

Abstract U.

Deaths amongst Employés from causes Beyond Control of Companies, also from causes Under Control of Companies, 1840—51.

Causes.	Class of Persons.									
	Engine Drivers.		Stokers.		Guards.		Porters.		Other Servants.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
(*a*)–Beyond control of the Companies	24	31	56	42	61	27	46	15	438	143
(*b*)–Under control of the Companies, including Miscellaneous . . .	38	53	42	64	54	57	52	41	147	141
Per centage of (*a*) .	38·71	36·90	57·14	39·62	53·04	32·14	46·94	26·79	74·87	50·35
Per centage of (*b*) .	61·29	63·10	42·86	60·38	46·96	67·86	53·06	73·21	24·13	49·65

In Abstract I, page 258 *ante*, the fatal accidents to passengers, assumed to be "under control" of the companies, were found to be 55·3 per cent. of the whole; but in this Abstract it will be seen, that, with the exception of the class "Engine Drivers," the ratio of accidents "under control of the companies" is, on the whole, considerably under that for passengers. In the preceding Abstract, the accidents in the miscellaneous

or unclassified group are placed among those "under control of the companies;" but the more correct mode of comparison is clearly, for the reasons assigned in page 259 *ante*, to exclude them; and, therefore, in the next Abstract, which has been prepared to shew whether the accidents, assumed to arise from causes "under control of the companies," be increasing or diminishing, the miscellaneous group is not taken into account:—

Abstract V.

Deaths among Different Classes of Employés, shewing those from causes beyond the Control of the Companies, and those not under such Control.

Causes.	Engine Drivers, Stokers and Guards.			Porters and Other Servants.		
	1840-43.	1844-47.	1848 51.	1840-43.	1844-47.	1848-51.
Beyond control of Company .	19	44	78	80	177	227
Under control of Company, excluding Micellaneous . .	3	36	42	15	32	77
Mortality per Cent. of each Class to the Total.						
Beyond control of Company . .	86·37	55·00	65·00	84·21	84·69	74·67
Under control of Company, excluding Miscellaneous . .	13·63	45·00	35·00	15·79	15·31	25·33

If the results in this be compared with those in the preceding Abstract, a very important distinction will be observable, the ratio of accidents assumed as "under control "of the companies" being very much less, in consequence of the group of accidents in the miscellaneous or undefined groups being excluded. But there is one feature appearing in Abstract V of anything but a satisfactory nature, namely, that the ratio of accidents "under control of the companies," in reference to the total deaths from all causes, have, contrary to that which was found to prevail in Abstract J in regard to passengers, been increasing. In page 256 *ante*, however, while describing Table XXI, it was clearly shewn that, although such modes of exhibiting the relation of statistical facts have their uses, serious objections may still be brought against them when any exact or strict investigation is attempted. In order, therefore, to avoid such objections, the following Table has been prepared on the plan of Abstract K, and similar in some respects to Table XXXV, only that the accidents arising from causes "under control of companies" are distinguished from those considered as "beyond the control of companies." The first section shews the ratio of deaths from causes "beyond" and "under" control of the companies, in the same manner as that followed in Abstract V, only more in detail; but the second section of the same Table furnishes the exact ratio of mortality per annum to the numbers exposed to risk in each class of employés:—

[The second

Table XXXVI.

Number and Ratio per Cent. of Deaths from causes Beyond and Under Control of the Companies to the Total Deaths from all ascertained causes, for each Class of Employés.

Causes.	Deaths of Engine Drivers.						Deaths of Stokers.						Deaths of Guards.						Deaths of Porters.						Deaths of other Servants.					
	1840-43.		1844-47.		1848-51.		1840-43.		1844-47.		1848-51.		1840-43.		1844-47.		1848-51.		1840-43.		1844-47.		1848-51.		1840-43.		1844-47.		1848-51.	
	Number.	Per Cent. of Total.	Number.	Per Cent. of Total.	Number.	Per Cent. of Total.	Number.	Per Cent. of Total.	Number.	Per Cent. of Total.	Number.	Per Cent. of Total.	Number.	Per Cent. of Total.	Number.	Per Cent. of Total.	Number.	Per Cent. of Total.	Number.	Per Cent. of Total.	Number.	Per Cent. of Total.	Number.	Per Cent. of Total.	Number.	Per Cent. of Total.	Number.	Per Cent. of Total.	Number.	Per Cent. of Total.
Beyond control of Companies	6	85·72	8	32·00	10	47·62	6	85·72	21	61·76	29	65·91	7	87·50	15	71·43	39	70·91	8	57·14	15	55·56	23	53·49	72	88·89	162	89·01	204	78·16
Under control of Companies	1	14·28	17	68·00	11	52·38	1	14·28	13	38·24	15	34·09	1	12·50	6	28·57	16	29·09	6	42·86	12	44·44	20	46·51	9	11·11	20	10·99	57	21·84

Exact Rate of Mortality per Annum to the Number Exposed to Risk in each Class.

Causes.	Deaths of Engine Drivers.			Deaths of Stokers.			Deaths of Guards.			Deaths of Porters.			Deaths of other Servants.		
	1840-43.	1844-47.	1848-51.	1840-43.	1844-47.	1848-51.	1840-43.	1844-47.	1848-51.	1840-43.	1844-47.	1848-51.	1840-43.	1844-47.	1848-51.
Number exposed to risk .	2,051	3,658	7,910	2,127	3,800	8,205	1,902	3,394	7,339	8,985	16,037	34,677	45,149	80,511	174,323
Beyond control of Companies	6	8	10	6	21	29	7	15	39	8	15	23	72	162	204
Under control of Companies	1	17	11	1	13	15	1	6	16	6	12	20	9	20	57
Ratio of, Beyond control of Companies	One in 342	One in 457	One in 791	One in 354	One in 181	One in 283	One in 272	One in 226	One in 188	One in 1,123	One in 1,069	One in 1,508	One in 627	One in 497	One in 855
Ratio of, Under control of Companies	2,051	215	719	2,127	292	547	1,902	566	459	1,497	1,336	1,734	5,017	4,026	3,058

The second section of this Table is calculated to throw important light on the question of railway accidents, as they affect the different classes of employés, both as regards the causes "beyond control of the companies" and those assumed to fall "under "control of the companies." In describing Abstract T, it was pointed out that, ever since 1844, the accidents from all causes have been diminishing; so also, in the preceding Table, it will be found that generally in each class of servants the fatal accidents have been decreasing within the same period, whether viewed in respect to the causes "beyond "control of the companies" or otherwise, the exceptions being in the group of "guards," and in the group of "other servants" for accident from causes "under control of companies." The following Abstract, however, of this Table will place the question in a clearer light:—

ABSTRACT W.

Ratio of Deaths amongst Employés from causes Beyond and Under Control of the Companies, 1840–51.

	Engine Drivers, Stokers, and Guards.			Porters and other Servants.			Engine Drivers, Stokers, Guards, Porters, and other Servants.		
	1840 to 1843.	1844 to 1847.	1848 to 1851.	1840 to 1843.	1844 to 1847.	1848 to 1851.	1840 to 1843.	1844 to 1847.	1848 to 1851.
Number exposed to risk . .	6,080	10,852	23,454	54,134	96,548	209,000	60,214	107,400	232,454
Beyond control of Companies	19	44	78	80	177	227	99	221	305
Under control of Companies	3	36	42	15	32	77	18	68	119
Ratio of, Beyond control of Companies	One in 320	One in 247	One in 301	One in 677	One in 545	One in 921	One in 608	One in 486	One in 762
Ratio of, Under control of Companies	2,027	302	558	3,609	3,017	2,714	3,345	1,579	1,953

It is thus obvious that, so far as engine-drivers, stokers, and guards are concerned, there has been a decided decrease in the accidents, both from causes "beyond" and "under" control of the companies, and, consequently, an absolute decrease in the mortality from all causes; but in the case of porters and other servants, it will be found that, while the deaths from causes "beyond the control of companies" have diminished in a very marked manner, those from causes "under control of the companies" have increased. In the last section of the preceding Abstract, it will, however, be seen that, viewing all the railway employés in the aggregate, there has been a decided decrease in the deaths from both classes of accidents, whether from causes beyond or under control of the companies. In Abstract K, it will be found that, among passengers, although the deaths from all causes had largely decreased since 1844, still those from causes "beyond the "control of the companies," in that period, increased, but not in so great a ratio as the deaths from causes "under the control of the companies," had diminished. The decrease from causes "under the control of the companies," it will be observed, by comparing the results of Abstract R for passengers with those of Abstract W for employés, is very nearly

the same within the period 1844–51. From the principle on which Tables XXXI, XXXII, and XXXIII, have been formed, it is questionable whether the number of employés therein deduced as being in the service of the companies prior to the year 1844, can be safely relied on, although subsequent to that period they may be considered as strictly applicable to the purposes to which they have been applied in this contribution; in fact, subsequent to 1847, a census has been taken in the alternate years. Looking, however, at the figures determined for the years 1840–43, it is to be doubted whether the number of employés then in actual service was not much less than stated in the Tables just referred to. For other reasons than those appearing from an examination of the figures in Table XXXIII, it may be fairly assumed that, in the early period of railway management, a less number of employés was required in the railway service, *pro rata* to the extent of the line of railway open to traffic; for it has already been shewn, in the early part of this communication, that both the passenger and goods traffic have increased in a much higher ratio than the extent of miles of railway open for traffic, and, consequently, the number of railway employés has also increased in a like high ratio. This is an important consideration to bear in mind while engaged on this part of the inquiry which relates to employés only. The same difficulty did not arise while engaged in the examination of a similar question in respect to passengers, for the number of passengers and the extent of mileage were known for each year of the whole period under observation; but, as already stated, no census of railway employés was available for the purpose of this inquiry until May, 1848. Assuming that the remarks now advanced, in respect to the estimated number of employés given in Table XXXIII, are generally correct, it will follow that the actual rate of mortality among railway employés, for the period 1840–43, was much greater than that shewn in the preceding Tables and Abstracts, and hence, in the present state of the investigation of this question, it would be difficult to assert positively whether, as in the case of passengers, the mortality of employés has not also uniformly diminished ever since 1840, notwithstanding the indications to the contrary contained in Table XXXVI and Abstract W.

Whatever opinions may be held as to the improvements likely to take place in railway management for the future, for the protection of the lives of passengers and employés, one thing is quite certain, that in the period within which observations and recorded facts may be safely relied on, great improvements must have been effected in the management of railway affairs; and more credit is due to those intrusted with the conduct of these matters than either the public press or the people of this country have for a long time seemed disposed to accord to them.

In pages 260–1 *ante*, will be found important facts and deductions in relation to "collisions;" and although that portion of the inquiry had special reference to passengers, many of the observations are equally applicable to the case of employés. The following Table exhibits the number of deaths taking place from collisions at stations, and from collisions not at stations, during the period 1844–51:—

[It will be

Table XXXVII.

The Number and Ratio of Deaths from Collisions happening at Stations, and from Collisions not at Stations, during the Years 1844-52, *among*

Period.	Engine Drivers.				
	Number.	Not at Station.		At Station.	
		Killed.	One in	Killed.	One in
1844 to 1847	3,658	4	914	2	1,829
1848 ... 1851	7,910	2	3,955	1	7,910
1852	2,446	...	...	3	815
1844 to 1852	14,014	6	2,336	6	2,336

Period.	Stokers.				
	Number.	Not at Station.		At Station.	
		Killed.	One in	Killed.	One in
1844 to 1847	3,800	2	1,900	2	1,900
1848 ... 1851	8,205	3	2,735	2	4,102
1852	2,537	2	1,268	1	2,537
1844 to 1852	14,542	7	2,077	5	2,908

Period.	Guards.				
	Number.	Not at Station.		At Station.	
		Killed.	One in	Killed.	One in
1844 to 1847	3,394	2	1,697	1	3,394
1848 ... 1851	7,339	1	7,339	3	2,446
1852	2,269	...	...	...	...
1844 to 1852	13,002	3	4,334	4	3,251

Period.	Porters.				
	Number.	Not at Station.		At Station.	
		Killed.	One in	Killed.	One in
1844 to 1847	16,037	...	...	2	8,018
1848 ... 1851	34,677	...	...	1	34,677
1852	10,722	...	...	1	10,722
1844 to 1852	61,436	...	...	4	15,359

Period.	Other Servants.				
	Number.	Not at Station.		At Station.	
		Killed.	One in	Killed.	One in
1844 to 1847	80,511	2	40,255	1	80,511
1848 ... 1851	174,323	4	43,581	7	24,903
1852	53,897	5	10,779	...	...
1844 to 1852	308,731	11	28,066	8	38,591

It will be seen that this class of accidents, which, in the case of passengers, was shewn, at page 260, to constitute nearly 59 per cent. of all accidents assumed to be under the control of the companies, does, in regard to employés, amount to little more than 21 per cent. of all the accidents arising from causes under the control of the companies; and this is a distinction which it is of much importance to keep in view, as it is calculated to throw much light on the proximate cause of accidents in railways, and the direction in which improvements are more immediately to be looked for. With this object in view, the following Abstract has been prepared, shewing, in reference to the causes assumed to be under control of the companies, the degree in which each particular class of employés is subject to each kind of accident, as well as the relation between each class of employés, and also all employés in the aggregate, to passengers in this respect:—

Abstract X.

The Number of Deaths amongst Railway Employés, and amongst Passengers, during the Years 1840–52, from Accidents under Control of the Companies.

Cause of Accident.	Class of Employés.						
	Engine Drivers.	Stokers.	Guards.	Porters.	Other Servants.	Total of Employés.	Passengers.
Collision	6	8	3	...	11	28	29
Off line	19	13	6	1	6	45	35
Running into station .	1	...	...	...	...	1	5
Collision at station .	6	5	4	4	8	27	35
Crushed	3	13	14	41	72	143	5
Total . . .	35	39	27	46	97	244	109

Accidents from collisions are, relatively to the whole of the above class of accidents, obviously not so fatal to any one class of railway servants, nor consequently to the whole collectively, as to passengers.

In the former part of this paper a very complete investigation has been made of the various circumstances under which collisions took place, distinguishing those collisions at stations from those not at stations, and also those in which the immediate cause was the state of the weather, defects in machinery, neglect, and other circumstances; besides, it was further shewn to what extent the various accidents from collisions arose from passenger trains running into other passenger trains, from passenger trains into trains of another sort, from trains other than passenger trains into passenger trains, and from trains, neither of which were passenger trains. And although the data there brought forward have more especial reference to the injuries sustained by passengers, the facts are quite as completely given in regard to employés themselves; and it is therefore now unnecessary to enlarge on the particular questions then discussed. In respect, however, to the preceding Abstract of this group of accidents, namely, those assumed to be under control of the

companies, the following modification in the way of exhibiting the results will shew the relative frequency of each kind of accident to all causes of the same group of accidents.

Abstract Y.

Ratio of Deaths amongst each Class of Railway Employés and amongst Passengers, during the Years 1840—52, from each kind of Accident Under Control of the Companies, to the Deaths from all causes assumed as being Under Control of the Companies.

Cause of Accident.	Class of Employés.						
	Engine Drivers.	Stokers.	Guards.	Porters.	Other Servants.	Total of Employés.	Passengers.
Collision	17·14	20·52	11·11	...	11·34	11·47	26·60
Off line	54·29	33·33	22·22	2·17	6·18	18·44	32·11
Running into station .	2·86	...	...	...	...	0·41	4·59
Collision at station .	17·14	12·82	14·82	8·70	8·25	11·07	32·11
Crushed	8·57	33·33	51·85	89·13	74·23	58·61	4·59

The following are the causes amongst those assumed to be under control of the companies, which are most fatal to each class of persons, viz.:—

In the class—		
Engine Drivers . . .	Running off line	= 54·3 per cent. of the whole of the above.
Stokers	Collisions, Off line, and Crushed are equal	= 33·3 ... ...
Guards	Crushed	= 51·9 ... ...
Porters	Do.	= 89·1 ... ...
Other Servants . . .	Do.	= 74·2 ... ...
Total Employés . . .	Do.	= 58·6 ... ...
Passengers	Collisions	= 58·7 ... ...

Of the accidents under control of the companies, it is remarkable how great a proportion of the deaths among employés comes under the denomination "crushed," particularly amongst porters and other servants. Even in the whole group of employés the ratio from this cause is as high as 58·61 per cent., while amongst passengers it is no more than 4·59 per cent.; and, therefore, by keeping these facts in view, there can be no difficulty in understanding the great discrepancy between the ratio of killed and injured among employés and passengers.

Having said this much in regard to the way in which different classes of persons are affected by different kinds of accidents, we shall now return to the subject of Table XXXVII. The following is a condensed Abstract of it, and will afford a ready means of judging how far fatal accidents from collisions have decreased in recent years.

Abstract Z.

Ratio of Fatal Accidents from Collisions at different periods amongst Railway Employés.

Period.	Engine Drivers, Stokers, and Guards.					Porters and other Servants.				
	Number Exposed to Risk.	Not at Station.		At Station.		Number Exposed to Risk.	Not at Station.		At Station.	
		Killed.	One in	Killed.	One in		Killed.	One in	Killed.	One in
1844–47	10,852	8	1,356	5	2,170	96,548	2	48,274	3	32,183
1848–51	23,454	6	3,909	6	3,909	209,000	4	52,250	8	26,125
1852	7,252	2	3,626	4	1,813	64,619	5	12,924	1	64,619
1844–52	41,558	16	2,597	15	2,770	370,167	11	33,651	12	30,847

It is hence obvious that so far as the first group of servants are concerned, the danger of fatal accidents from collisions of both kinds has greatly decreased in recent years, but in regard to collisions at stations such has not been the case amongst the other group of railway servants, namely, " porters and other servants."

The next part of this question to which attention is directed is similar to that contained in Abstract M of the preceding paper, which shewed the accidents which had happened to passengers from collisions with trains of different kinds. At page 270 it will be found that throughout the whole period of nine years, 1844–52, but one death of a passenger took place from collisions of " express" trains, and also only one from collisions of " excursion," while none happened from collisions of mail trains, the " ordinary" trains being most fatal to passengers; so also will the same thing be found with regard to *employés*. The following condensed Abstract from Table XXV gives a general view of the results arrived at.

Abstract A*a*.

Ratio of Deaths and Injuries amongst Employés to the Number of Collisions during 1844-52.

Trains.	Collisions.		Employés.		Ratio of Deaths and Injuries to			
	Non-Serious.	Serious.	Killed.	Injured.	All Collisions.		Serious Collisions.	
					Killed.	Injured.	Killed.	Injured.
Express	3	8	2	11	·182	1·000	·250	1·375
Excursion.	1	7	...	...	...	...	...	...
Mail	8	13	4	8	·190	·381	·308	·615
Ordinary	42	173	22	57	·102	·265	·127	·329
Total	54	201	28	76	·110	·298	·139	·378

Although the " ordinary" trains have had the greatest number of collisions, and have

also suffered most from this class of accidents, yet when a collision of either an "express" or a "mail" train has taken place, it has proved more fatal to employés than a collision of an "ordinary train;" but on referring to Abstract M the reverse will be found to have been the case in regard to passengers, the collisions of "ordinary" trains being not only more frequent but also more severe and fatal than those of "express," "excursion," and "mail" trains.

In regard to the tendency which accidents from collisions have had since the year 1844, to occasion a greater or a less ratio of non-fatal injuries amongst employés, it will be seen from the following Abstract that in the classes "Engine Drivers" and "Guards" there has been a marked and most decided decrease, varying, amongst engine-drivers, from one in 366 to one in 805 per annum, and amongst guards from one in 566 to one in 1,135. In the class "Stokers," however, which appears much more liable to accidents of this kind than the other two classes, it will be observed that during the period 1848–51 the ratio of injuries was less than in either the preceding or subsequent period, but still, while the ratio was as high as one in 292 in the first period, it became reduced to one in 507 in 1852.

ABSTRACT A*b*.

The Number and Ratio of Injuries from Collisions happening at Stations, and from Collisions not at Stations, during the Years 1844—52, *among*

Period.	Engine Drivers.			Stokers.			Guards.		
	Number.	Injured.	One in	Number.	Injured.	One in	Number.	Injured.	One in
1844 to 1847 . . .	3,658	10	366	3,800	13	292	3,394	6	566
1848 ... 1851 . . .	7,910	10	791	8,205	8	1,026	7,339	8	917
1852	2,416	3	805	2,537	5	507	2,269	2	1,135
1844 to 1852 . . .	14,014	23	609	14,542	26	559	13,002	16	813

The part of this question which is next to be considered is that of the fatal accidents to employés from trains "running off the line." According to Abstracts R and X this cause of accidents has been more fatal to engine-drivers, stokers, and guards, than collisions; but it has been otherwise to the other railway servants and to passengers. It will also be observed that of 45 deaths amongst employés from trains running off the line, no less than 38 are recorded as happening to engine-drivers, stokers, and guards; and this is only what might be expected, as they are more than any other of the employés exposed to this kind of accidents, while porters and other servants are more liable to death and injury from being crushed, as shewn in Abstracts X and Z. The following Table shews the deaths and injuries resulting from trains running off the line, since the year 1844:—

Table XXXVIII.

The Number and Ratio of Deaths and Injuries from Trains running "Off the Line" during the Years 1844–52, *among*

Period.	Engine Drivers.			Stokers.			Guards.		
	Number.	Off Line.		Number.	Off Line.		Number.	Off Line.	
		Killed.	One in		Killed.	One in		Killed.	One in
1844 to 1847	3,658	11	333	3,800	4	950	3,394	1	3,394
1848 ... 1851	7,910	5	1,582	8,205	5	1,641	7,339	2	3,670
1852 . . .	2,446	3	815	2,537	4	634	2,269	3	756
1844 to 1852	14,014	19	738	14,542	13	1,119	13,002	6	2,167
Period.	Number.	Injured.	One in	Number.	Injured.	One in	Number.	Injured.	One in
1844 to 1847	3,658	7	523	3,800	8	475	3,394	6	566
1848 ... 1851	7,910	9	879	8,205	5	1,641	7,339	2	3,670
1852 . . .	2,446	5	489	2,537	3	846	2,269	3	756
1844 to 1852	14,014	21	667	14,542	16	909	13,002	11	1,182

One of the most startling results appearing in this inquiry will be found in the preceding Table. It will be seen that, whether attention be directed to the number of deaths or to the number of non-fatal injuries, in the year 1852 the ratio for each class was amazingly increased beyond that of the period of years immediately preceding, namely, 1848–51. The very wonderful rate of increase in this class of accidents during the year 1852 is difficult to be understood, and the extraordinary increase in the deaths and injuries of employés is not easily to be accounted for. On referring to Table XXVIII it will be seen that the number of trains or parts of trains which actually ran off the rails in that year, was less than in the preceding period relatively, not only to the extent of railway communication open for traffic, but also to the number of persons employed in the service of the companies; and moreover the deaths and injuries of passengers from trains running off the line during 1852 were greatly below the averages of the years 1848–51. In 1852 not a single passenger was killed from trains running off the line, and not more than 17 were injured,

Table XXXIX.

Shewing the Number of Deaths and Injuries to Railway Employés and to Passengers from Railway Accidents in Great Britain and Ireland, during the period 1st January, 1853, to 31st December, 1856.

	Collisions.				Trains getting off the Rails.				Trains running into Sidings through Points being wrong.				Axles or Wheels of Engines attached to Trains breaking.				Axles or Wheels of Carriages or Waggons breaking.				Couplings breaking.				Bursting of the Boilers of Engines.				Running into Station at too high a Speed, &c.				All Causes.			
	Passenger Trains.		Goods or Mineral Trains.		Passenger Trains.		Goods or Mineral Trains.		Passenger Trains.		Goods or Mineral Trains.		Passenger Trains.		Goods or Mineral Trains.		Passenger Trains.		Goods or Mineral Trains.		Passenger Trains.		Goods or Mineral Trains.		Passenger Trains.		Goods or Mineral Trains.		Passenger Trains.		Goods or Mineral Trains.		Passenger Trains.		Goods or Mineral Trains.	
Number of Accidents	157		30		63		7		21		1		28		3		18		14		4		6		4		7		3		2		298		70	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Number of Passengers	45	955	1*	...	7	104	...	...	...	93	...	...	...	9	...	...	3	16	...	...	1	14	...	...	...	4	1*	...	...	6	...	...	56	1201	2	...
Number of Servants of Companies	22	58	15	48	18	31	3	1	8	15	...	...	3	5	2	...	1	3	...	2	...	...	2	2	5	2	11	15	...	...	3	4	57	114	36	72
Total Passengers and Servants	67	1013	16	48	25	135	3	1	8	108	...	...	3	14	2	...	4	19	...	2	1	14	2	2	5	6	12	15	...	6	3	4	113	1315	38	72

* In charge of Cattle.

Table XL.

Number of Persons Killed and Injured on all the Railways open for traffic in Great Britain and Ireland, during the period 1st January, 1853, to 31st December, 1856.

Year.	Passengers Killed or Injured from Causes beyond their own control.		Passengers Killed or Injured from their own Misconduct or want of Caution.		Servants of Companies or of Contractors Killed or Injured from Causes beyond their own control.		Servants of Companies or of Contractors Killed or Injured from their own Misconduct or want of Caution.		Other Persons Killed or Injured in Crossing at Level Crossings.		Trespassers.		Miscellaneous.		Total.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Ending 1853	36	280	28	20	62	89	97	43	31	11	50	6	1	...	305	449
1854	12	331	19	15	39	56	73	31	38	3	52	17	...	...	223	453
1855	10	311	18	20	28	41	97	51	35	6	56	14	2	1	246	444
1856	8	282	19	16	30*	46	112	34	28	2	71	7	13	7	281	394
Total.....	66	1204	84	71	159	232	379	159	122	22	229	44	16	8	1055	1740

STATISTICS OF CRIME.

In the present paper, an analysis is attempted to be made of the state of Crime in England and Wales, from the returns furnished by the Home Office, for the years 1834–54.

The first point to which attention will be directed, is the influence of age in the production of crime, and its importance as an element in all inquiries concerning the amount and progress of crime, in various districts, and during various periods. In fact, every accurate investigation into the state of crime of a county will be found to involve the consideration of so many important elements of its vital statistics, that the one branch of study necessarily includes the other.

It was necessary to calculate the population for those years; and the formula given in pp. 2–3 *ante*, has been employed for that purpose, both in respect to the whole population of England and Wales, and the different counties and districts hereafter referred to.

The correction pointed out in page 2 as necessary in regard to the unenumerated ages of the population, was also applied to the enumeration of ages in the criminal returns for the respective years.

The preceding corrections having been applied to the numbers given in the Reports of the Census Commissioners, and also to the numbers given in the Home Office Returns of criminals, the following Tables I and II have been produced.

In the second column of each Table will be found the corrected population for England and Wales at the respective ages, for each of the years 1842, 1843, and 1844; and in the third column the total population for those years at each term of life; the fourth column

[represents

Table I.

Criminal Offenders in England and Wales in 1842, 1843, *and* 1844, *with the Ratio of Crime to the Population at the various Terms of Life calculated to the corrected Population for the respective Periods.—Males.*

Age.		Population.		Criminals.		Ratio of Criminals to total Population.
Under 5	1842	1056117				
	1843	1064261				
	1844	1072470				
			3192848			
5–10	1842	962144				
	1843	971341				
	1844	980625				
			2914110			
10–15	1842	891542				
	1843	902764				
	1844	914128				
			2708434			
Under 15	1842	2909803		1463		
	1843	2938366		1465		
	1844	2967223		1423		
			8815392		4351	·0494
15–20	1842	793575		5755		
	1843	805586		5633		
	1844	817778		5146		
			2416939		16534	·6841
20–25	1842	739960		6531		
	1843	756457		6145		
	1844	847932		5380		
			2344349		18056	·7702
25–30	1842	624834		4008		
	1843	638765		3750		
	1844	578397		3273		
			1841996		11031	·5989
30–40	1842	1020198		4437		
	1843	1040491		4058		
	1844	1061190		3348		
			3121879		11843	·3794
40–50	1842	761076		2117		
	1843	773078		1935		
	1844	785268		1755		
			2319422		5807	·2504
50–60	1842	503017		960		
	1843	509233		814		
	1844	515525		814		
			1527775		2588	·1694
60 and upwards	1842	539606		469		
	1843	545488		451		
	1844	551435		410		
			1636529		1330	·0813
Proportion, 1 in 336			24024281		71540	·2978

Table II.

Criminal Offenders in England and Wales in 1842, 1843, *and* 1844, *with the Ratio of Crime to the Population at the various Terms of Life calculated to the corrected Population for the respective Periods.—Females.*

Age.		Population.		Criminals.		Ratio of Criminals to total Population.
5 . . .	1842	1068046				
	1843	1077628				
	1844	1087296				
			3232970			
5–10 . . .	1842	961863				
	1843	971510				
	1844	981252				
			2914625			
10–15 . . .	1842	863979				
	1843	875707				
	1844	887595				
			2627281			
Under 15 . . .	1842	2893888		243		
	1843	2924845		249		
	1844	2956143		209		
			8774876		701	·0080
15–20 . . .	1842	816962		1268		
	1843	828259		1266		
	1844	839711		1182		
			2484932		3716	·1495
20–25 . . .	1842	843544		1356		
	1843	859533		1243		
	1844	875824		1164		
			2578901		3763	·1459
25–30 . . .	1842	685508		869		
	1843	698501		784		
	1844	711741		738		
			2095750		2391	·1141
30–40 . .	1842	1071235		944		
	1843	1090081		907		
	1844	1109258		821		
			3270574		2672	·0817
40–50 . . .	1842	790308		527		
	1843	802515		525		
	1844	814910		496		
			2407733		1548	·0643
50–60 . . .	1842	537073		247		
	1843	544494		256		
	1844	552018		258		
			1633585		761	·0466
60 and upwards .	1842	620788		115		
	1843	628893		110		
	1844	637103		125		
			1886784		350	·0186
Proportion, 1 in 1581			25133135		15902	·0633

represents the number of criminal offenders in England and Wales during each of the same three years, and at each term of life; and the fifth column contains the totals for the three years. These lead to the consideration of the sixth column, which shews the ratio per cent. of criminal offenders at each term of life, to the population at the same term of life. An examination of this column will immediately shew its importance and its bearing on Criminal Statistics. The tendency to crime among the male population at various terms of life, will be found in Table I to vary from ·7702 per cent. to ·1694 per cent.; or, in other words, the tendency to crime at one period of life is more than quadruple that at another. In Table II, similar results will be found for the female population, but with a lower specific and absolute intensity to crime. Over the whole male population of England and Wales, the tendency to crime will be found to be ·2978 per cent., but for the female sex it will be found to be ·0633 per cent.

One very striking and important feature in Table I is the fact, that more than one-fourth of all the criminal offenders in England and Wales, will be found to be at the quinquennial period of life 20 to 25; and, further, that the number of criminals in the same period exceed those in the succeeding quinquennial period by at least 63 per cent. On a comparison of Tables I and II, it will be found that the tendency to crime in the female population is only 21 per cent. of that in the male population; and if the term of life 20 to 25 be taken, the amount of crime among females will be seen to be only 19 per cent. of that among males; or, in other words, there is five times as much crime in the male population as among an equal number of the female population of the country. Two most important facts thus disclose themselves; first, that the great amount of crime is committed at a given term of life; and second, that while one in every 336 of the male population is yearly guilty of a criminal offence, in the female sex the number is one in every 1581 only.

These facts being established, it will follow that, although in two different districts the tendency to crime in each sex at the respective terms of life may be precisely the same, still, should there be a difference in the distribution of the population over the various periods of life, or a higher proportion of males in the one district than in the other, the usual methods of investigating such questions, in which the element of age is not considered, would lead to the fallacious conclusion, that in the one place there was a greater tendency to crime than in the other. In order more fully to establish this point, the following Tables, III and IV, have been prepared, containing the male and female population in England and Wales, for the respective terms of life recognised in the Home Office Returns for criminal offenders. These numbers are collected and arranged from the census returns for 1841; and in Table V the same facts in relation to the male sex will be found set forth in a different form, with an additional column, representing the ratio per cent. of the population at each term of life to the whole population of the male sex in every county.

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Table III.

Population.—England and Wales.—1841.—*Males.*

Counties.	Aged under 15 Years.	Aged 15 Years and under 20.	Aged 20 Years and under 25.	Aged 25 Years and under 30.	Aged 30 Years and under 40.	Aged 40 Years and under 50.	Aged 50 Years and under 60.	Aged 60 Years and above.	Total.
Bedford	20684	5286	4584	3713	6270	4819	3065	3710	52131
Berks	29361	7853	7184	5886	9934	7694	5343	6341	79596
Bucks	29242	7790	6449	5430	8912	7207	5018	6179	76227
Cambridge	31194	8203	7887	6116	9839	7786	4910	5396	81331
Cheshire	73390	20302	18470	15309	24738	17617	11494	11206	192526
Cornwall	67108	17517	13770	11158	18605	14761	10066	11310	164295
Cumberland	32256	8855	7792	6247	10195	8112	5948	6513	85918
Derby	50695	13755	12026	10484	17095	12719	8769	9680	135223
Devon	95058	25727	21277	17604	29491	23864	18206	20822	252049
Dorset	32656	8206	6670	5722	9749	7760	5559	7137	83459
Durham	61202	16430	15837	13244	20345	13881	9086	9677	159702
Essex	64617	16647	15362	12722	20708	17107	11304	12843	171310
Gloucester	75469	20142	18346	15441	25916	20285	13432	15299	204330
Hereford	19586	5502	4782	4169	7125	5956	4270	5476	56866
Hertford	29630	7814	6853	5634	9395	7255	4970	5569	77120
Huntingdon	11075	3005	2693	2163	3352	2756	1802	2099	28945
Kent	98569	26710	25731	19715	33474	25299	18058	21928	269484
Lancaster	303779	85122	81057	69472	113866	75441	44921	39419	813077
Leicester	39389	10749	9061	7603	12812	10379	7050	8434	105477
Lincoln	66780	18202	16813	13744	21936	17494	11674	13823	180466
Middlesex	237999	66724	75832	69575	113609	82375	48145	39286	733545
Monmouth	23931	6810	7903	6702	10008	6709	4166	4238	70467
Norfolk	47832	20150	16554	13608	23375	20071	13122	17060	198772
Northampton	36439	10169	9008	7197	12112	9495	6465	7777	98662
Northumberland	44474	12234	11668	9746	15458	11144	7803	8345	120872
Nottingham	45795	11811	10216	8789	15554	11957	8112	9147	121381

TABLE III.—(*continued.*)

Population.—England and Wales.—1841.—*Males.*

COUNTIES.	Aged under 15 Years.	Aged 15 Years and under 20.	Aged 20 Years and under 25.	Aged 25 Years and under 30.	Aged 30 Years and under 40.	Aged 40 Years and under 50.	Aged 50 Years and under 60.	Aged 60 Years and above.	Total.
Oxford	29853	8092	7453	5699	9604	7609	5326	6540	80176
Rutland	3961	1110	895	708	1283	1030	716	956	10659
Salop	43315	12330	10586	9002	14844	11462	7965	9533	119037
Somerset	77906	21562	18398	15093	24974	20341	13978	16666	208918
Southampton	63786	17329	16244	13192	20873	16442	12534	13944	174344
Stafford	98920	26193	24633	21616	33266	23298	14908	14752	257586
Suffolk	58982	15555	12962	10598	17961	14505	10166	13103	153832
Surrey	98513	25057	25399	22971	39077	29010	18094	17086	275207
Sussex	56936	13991	12475	10385	17907	14022	9625	11211	146552
Warwick	71682	19198	18491	16010	25729	19220	12035	12417	194782
Westmoreland	10219	3023	2526	1972	3268	2619	1972	2475	28074
Wilts	48088	13282	11435	8842	14777	12234	8272	10524	127454
Worcester	42754	10927	10073	8628	14581	11264	7378	8644	114249
York	297615	82535	74064	61876	97820	72260	49010	50229	785409
Anglesea	9586	2366	1902	1605	2613	2275	1781	2165	24293
Brecon	9604	2844	2775	2362	3722	2572	1897	2247	28023
Cardigan	12811	3333	2639	2212	3589	2762	2200	2637	32183
Carmarthen	20524	5196	4009	3411	5859	4215	3274	4079	50567
Carnarvon	14931	3939	3497	3135	4880	3474	2646	2935	39437
Denbigh	16535	4691	3842	3166	5307	4119	3131	3582	44373
Flint	12746	3599	3077	2507	4090	3084	2130	2223	33456
Glamorgan	31177	8797	9476	8006	12406	7720	4810	5022	87414
Merioneth	7027	1817	1611	1515	2342	1697	1436	1817	19262
Montgomery	12932	3547	2850	2359	3948	3089	2579	2941	34245
Pembroke	16175	4067	3160	2592	4485	3615	2649	3376	40119
Radnor	4731	1305	1217	914	1359	1188	937	1153	12804

Table IV.

Population —England and Wales.—1841.—*Females.*

Counties.	Aged under 15 Years.	Aged 15 Years and under 20.	Aged 20 Years and under 25.	Aged 25 Years and under 30.	Aged 30 Years and under 40.	Aged 40 Years and under 50.	Aged 50 Years and under 60.	Aged 60 Years and above.	Total.
Bedford	20213	5763	5738	4344	6804	5293	3461	4118	55734
Berks	28708	7773	7686	6407	9957	7698	5494	6868	80591
Bucks	28614	7723	7415	6180	9639	7726	5419	6652	79368
Cambridge	31091	8128	8522	6473	9833	7612	4957	6144	82760
Chester	73263	21886	21384	16815	25672	18189	12239	12250	201698
Cornwall	65226	17477	16657	13008	20720	16508	11995	14880	176471
Cumberland	31696	9342	8912	7107	11052	8696	6582	8138	91525
Derby	50625	13800	12935	10735	17009	12687	8847	9775	136413
Devon	94527	27246	27754	22330	34347	27473	21021	25877	280575
Dorset	32579	8701	8792	6922	11165	8752	6282	8239	91432
Durham	60304	16184	16395	13334	21073	14553	10270	11955	164068
Essex	64564	16512	16474	13105	20492	16536	11179	13317	172179
Gloucester	75917	22460	23463	18588	29043	22445	15048	18710	225674
Hereford	19436	5375	5122	4227	6916	5533	4267	5962	56838
Hertford	28854	7661	7811	6254	9948	7671	5210	6029	79448
Huntingdon	11041	2950	2928	2205	3402	2744	1854	2288	29412
Kent	96865	26192	27703	22597	35197	26315	18346	21285	274500
Lancaster	304112	89897	93520	75845	117577	77117	48360	45201	851629
Leicester	39656	11009	10730	8652	13716	10689	7228	8532	110212
Lincoln	66177	17848	17649	13924	21539	16831	11716	14797	180481
Middlesex	243998	78046	98080	84472	132187	90821	54890	54009	836503
Monmouth	23347	6126	6806	5449	8324	5575	3709	4344	63680
Norfolk	74956	21011	20900	16089	25364	20812	14266	20109	213507
Northampton	36280	9715	9458	7595	12185	9591	6811	8482	100117
Northumberland	44002	12952	13306	10832	16567	11978	8744	10385	128766
Nottingham	46253	12783	12154	10157	16639	12409	8272	9479	128146

TABLE IV.—(*continued.*)

Population.—England and Wales.—1841.—*Females.*

	Aged under 15 Years.	Aged 15 Years and under 20.	Aged 20 Years and under 25.	Aged 25 Years and under 30.	Aged 30 Years and under 40.	Aged 40 Years and under 50.	Aged 50 Years and under 60.	Aged 60 Years and above.	Total.
Oxford	29635	8090	7531	6068	9829	7671	5296	6963	81083
Rutland	3885	938	895	778	1261	1045	692	1047	10541
Salop	43011	11613	11167	9190	14497	11255	8122	10711	119566
Somerset	77487	22278	22587	17582	27839	22048	16137	20503	226461
Southampton	62711	17536	18213	14562	22392	17419	12586	14382	179801
Stafford	98718	24068	24567	20208	30930	22156	14721	15864	251232
Suffolk	58552	15693	15496	12086	18816	15010	10681	14527	160861
Surrey	98768	27616	32363	27581	44380	31700	19810	22436	303654
Sussex	56579	14641	14756	11986	18881	14319	9674	10841	151677
Warwick	72544	20387	21488	17616	26855	19712	12615	14464	205681
Westmoreland	10296	2749	2428	2097	3262	2570	2018	2689	28109
Wilts	47500	12694	12165	9225	15220	12660	8984	11953	130401
Worcester	42891	11687	11358	9264	14892	11453	7482	9479	118506
York	296369	82937	79526	63861	99462	73056	50662	55387	801260
Anglesea	9153	2585	2324	1948	3039	2543	2128	2792	26512
Brecon	9664	2788	2671	2202	3267	2405	1897	2596	27490
Cardigan	12623	3697	3358	2858	4370	3308	2828	3500	36542
Carmarthen	20016	5766	5023	4073	6562	4877	3814	5512	55643
Carnarvon	14775	4129	3805	3143	4988	3708	2973	3729	41450
Denbigh	15901	4561	3942	3202	5168	4116	3216	4311	44417
Flint	12405	3162	2932	2401	3913	3163	2254	2836	33066
Glamorgan	30554	8184	8359	7034	10684	7219	4958	6262	83254
Merioneth	6798	1818	1724	1524	2319	1876	1615	2365	20039
Montgomery	12973	3554	2921	2388	3910	3102	2614	3456	34918
Pembroke	16403	4910	4667	3599	5596	4469	3374	4760	47778
Radnor	4712	1314	1102	854	1323	1090	910	1211	12516

Table V.

Population of England and Wales.—1841.—*With the Proportionate Numbers at each Term of Life.*—*Males.*

Age.	Bedford.		Berks.		Bucks.		Cambridge.	
	Population.	Per centage to the total living.	Population.	Per centage to the total living.	Population.	Per centage to the total living.	Population.	Per centage to the total living.
Under 15 . .	20684	39·677	29361	36·887	29242	38·362	31194	38·354
15...20 . .	5286	10·139	7853	9·866	7790	10·219	8203	10·086
20...25 . .	4584	8·793	7184	9·026	6449	8·460	7887	9·697
25...30 . .	3713	7·122	5886	7·395	5430	7·123	6116	7·520
30...40 . .	6270	12·027	9934	12·483	8912	11·691	9839	12·098
40...50 . .	4819	9·224	7694	9·666	7207	9·455	7786	9·573
50...60 . .	3065	5·879	5343	6·713	5018	6·583	4910	6·037
60 & upwards .	3710	7·116	6341	7·967	6179	8·106	5396	6·635
Total. . .	52131		79596		76227		81331	
Ages unknown	59		635		255		280	
Grand Total .	52190		80231		76482		81611	

	Cheshire.		Cornwall.		Cumberland.		Derby.	
Under 15 . .	73390	38·119	67108	40·846	32256	37·543	50695	37·576
15...20 . .	20302	10·545	17517	10·662	8855	10·306	13755	10·195
20...25 . .	18470	9·594	13770	8·381	7792	9·069	12026	8·914
25...30 . .	15309	7·952	11158	6·791	6247	7·271	10484	7·771
30...40 . .	24738	12·849	18605	11·324	10195	11·866	17095	12·671
40...50 . .	17617	9·150	14761	8·984	8112	9·442	12719	9·428
50...60 . .	11494	5·970	10066	6·127	5948	6·916	8769	6·500
60 & upwards .	11206	5·821	11310	6·884	6513	7·581	9680	7·175
Total. . .	192526		164295		85918		135223	
Ages unknown	1120		462		374		397	
Grand Total .	193646		164757		86292		135620	

	Devon.		Dorset.		Durham.		Essex.	
Under 15 . .	95058	37·714	32656	39·128	61202	38·323	64617	37·719
15...20 . .	25727	10·207	8206	9·832	16430	10·288	16647	9·718
20...25 . .	21277	8·442	6670	7·992	15837	9·917	15362	8·967
25...30 . .	17604	6·984	5722	6·856	13244	2·293	12722	7·426
30...40 . .	29491	11·700	9749	11·681	20345	12·739	20708	12·088
40...50 . .	23864	9·468	7760	9·298	13881	8·692	17107	9·986
50...60 . .	18206	7·223	5559	6·661	9086	5·689	11304	6·599
60 & upwards .	20822	8·261	7137	8·552	9677	6·059	12843	7·497
Total. . .	252049		83459		159702		171310	
Ages unknown	711		95		371		1038	
Grand Total .	252760		83554		160073		172348	

TABLE V.—(*continued.*)

Population of England and Wales.—1841.—*Males.*

Age.	GLOUCESTER.		HEREFORD.		HERTFORD.		HUNTINGDON.	
	Population.	Per centage to the total living.	Population.	Per centage to the total living.	Population.	Per centage to the total living.	Population.	Per centage to the total living.
Under 15 . .	75469	36·935	19586	34·442	29630	38·421	11075	38·262
15...20 . .	20142	9·858	5502	9·675	7814	10·132	3005	10·382
20...25 . .	18346	8·979	4782	8·409	6853	8·886	2693	9·304
25...30 . .	15441	7·557	4169	7·331	5634	7·306	2163	7·473
30...40 . .	25916	12·683	7125	12·529	9395	12·182	3352	11·581
40...50 . .	20285	9·928	5956	10·474	7255	9·407	2756	9·522
50...60 . .	13432	6·574	4270	7·509	4970	6·444	1802	6·226
60 & upwards .	15299	7·487	5476	9·630	5569	7·221	2099	7·252
Total . . .	204330		56866		77120		28945	
Ages unknown	1213		112		497		127	
Grand Total .	205543		56987		77617		29072	

	KENT.		LANCASTER.		LEICESTER.		LINCOLN.	
Under 15 . .	98569	36·577	303779	37·362	39389	37·343	66780	37·004
15...20 . .	26710	9·912	85122	10·469	10749	10·191	18202	10·086
20...25 . .	25731	9·548	81057	9·969	9061	8·591	16813	9·316
25...30 . .	19715	7·316	69472	8·544	7603	7·208	13744	7·616
30...40 . .	33474	12·421	113866	14·004	12812	12·147	21936	12·155
40...50 . .	25299	9·388	75441	9·279	10379	9·840	17494	9·694
50...60 . .	18058	6·701	44921	5·525	7050	6·684	11674	6·469
60 & upwards .	21928	8·137	39419	4·848	8434	7·996	13823	7·660
Total . . .	269484		813007		105477		180466	
Ages unknown	3048		1770		139		1292	
Grand Total .	272532		814847		105616		181758	

	MIDDLESEX.		MONMOUTH.		NORFOLK.		NORTHAMPTON.	
Under 15 . .	237999	32·445	23931	33·961	74832	37·647	36439	36·934
15...20 . .	66724	9·096	6810	9·664	20150	10·137	10169	10·307
20...25 . .	75832	10·338	7903	11·215	16554	8·328	9008	9·130
25...30 . .	69575	9·485	6702	9·511	13608	6·846	7197	7·295
30...40 . .	113609	15·487	10008	14·202	23375	11·760	12112	12·276
40...50 . .	82375	11·230	6709	9·521	20071	10·097	9495	9·624
50...60 . .	48145	6·563	4166	5·912	13122	6·602	6465	6·553
60 & upwards .	39286	5·356	4238	6·014	17060	8·583	7777	7·883
Total . . .	733545		70467		198772		98662	
Ages unknown	5359		139		329		315	
Grand Total .	738904		70606		199101		98977	

TABLE V.—(*continued.*)

Population of England and Wales.—1841.—*Males.*

Age.	NORTHUMBERLAND.		NOTTINGHAM.		OXFORD.		RUTLAND.	
	Population.	Per centage to the total living.	Population.	Per centage to the total living.	Population.	Per centage to the total living.	Population.	Per centage to the total living.
Under 15 . .	44474	36·795	45795	37·728	29853	37·234	3961	37·161
15...20 . .	12234	10·122	11811	9·731	8092	10·093	1110	10·414
20...25 . .	11668	9·653	10216	8·417	7453	9·296	895	8·397
25...30 . .	9746	8·063	8789	7·241	5699	7·108	708	6·642
30...40 . .	15458	12·789	15554	12·814	9604	11·979	1283	12·036
40...50 . .	11144	9·220	11957	9·851	7609	9·499	1030	9·663
50...60 . .	7803	6·456	8112	6·683	5326	6·643	716	6·717
60 & upwards .	8345	6·904	9147	7·536	6540	8·157	956	8·969
Total . .	120872		121381		80176		10659	
Ages unknown	396		350		260		62	
Grand Total .	121268		121731		80436		10721	

	SALOP.		SOMERSET.		SOUTHAMPTON.		STAFFORD.	
Under 15 . .	43315	36·388	77906	37·290	63786	36·586	98920	38·403
15...20 . .	12330	10·599	21562	10·321	17329	9·940	26193	10·169
20...25 . .	10586	8·893	18398	8·806	16244	9·317	24633	9·563
25...30 . .	9002	7·562	15093	7·224	13192	7·567	21616	8·392
30...40 . .	14844	12·470	24974	11·954	20873	11·972	33266	12·915
40...50 . .	11462	9·629	20341	9·736	16442	9·431	23298	9·045
50...60 . .	7965	6·691	13978	6·691	12534	7·189	14908	5·788
60 & upwards .	9533	8·008	16666	7·977	13944	7·998	14752	5·727
Total. . .	119037		208918		174344		257586	
Ages unknown	318		465		679		1278	
Grand Total .	119355		209383		175023		258864	

	SUFFOLK.		SURREY.		SUSSEX.		WARWICK.	
Under 15 . .	58982	38·342	98513	35·796	56936	38·850	71682	36·801
15...20 . .	15555	10·112	25057	9·105	13991	9·547	19198	9·856
20...25 . .	12962	8·426	25399	9·229	12475	8·512	18491	9·493
25...30 . .	10598	6·874	22971	8·347	10385	7·086	16010	8·220
30...40 . .	17961	11·703	39077	14·199	17907	12·191	25729	13·209
40...50 . .	14505	9·429	29010	10·541	14022	9·568	19220	9·867
50...60 . .	10166	6·609	18094	6·575	9625	6·568	12035	6·178
60 & upwards .	13103	8·518	17086	6·208	11211	7·650	12417	6·375
Total. . .	153832		275207		146552		194782	
Ages unknown	263		2996		1052		897	
Grand Total .	154095		278203		147604		195679	

TABLE V.—(*continued.*)

Population of England and Wales.—1841.—*Males.*

Age.	WESTMORELAND.		WILTS.		WORCESTER.		YORK.	
	Population.	Per centage to the total living.	Population.	Per centage to the total living.	Population.	Per centage to the total living.	Population.	Per centage to the total living.
Under 15 . .	10219	36·400	48088	37·730	42754	37·422	297615	37·893
15 ... 20 . .	3023	10·768	13282	10·421	10927	9·564	82535	10·509
20 ... 25 . .	2526	8·998	11435	8·972	10073	8·817	74064	9·430
25 ... 30 . .	1972	7·024	8842	6·937	8628	7·552	61876	7·878
30 ... 40 . .	3268	11·641	14777	11·594.	14581	12·762	97820	12·456
40 ... 50 . .	2619	9·329	12234	9·599	11264	9·859	72260	9·200
50 ... 60 . .	1972	7·024	8272	6·490	7378	6·458	49010	6·240
60 & upwards .	2475	8·816	10524	8·257	8644	7·566	50229	6·395
Total . . .	28074		127454		114249		785409	
Ages unknown	139		786		415		3384	
Grand Total .	28213		128240		114664		788793	

	ANGLESEA.		BRECON.		CARDIGAN.		CARMARTHEN.	
Under 15 . .	9586	39·460	9604	34·272	12811	39·807	20521	40·588
15 ... 20 . .	2366	9·739	2844	10·149	3333	10·356	5196	10·275
20 ... 25 . .	1902	7·829	2775	9·903	2639	8·200	4009	7·928
25 ... 30 . .	1605	6·607	2362	8·429	2212	6·873	3411	6 746
30 ... 40 . .	2613	10·756	3722	13·282	3589	11·152	5859	11·587
40 ... 50 . .	2275	9·365	2572	9·178	2762	8·582	4215	8·336
50 ... 60 . .	1781	7·331	1897	6·769	2200	6·836	3274	6·475
60 & upwards .	2165	8·912	2247	8·018	2637	8·194	4079	8·067
Total . . .	24293		28023		32183		50567	
Ages unknown	81		51		32		109	
Grand Total .	24374		28074		32215		50676	

	CARNARVON.		DENBIGH.		FLINT.		GLAMORGAN.	
Under 15 . .	14931	37·860	16535	37·264	12746	38·098	31177	35·666
15 ... 20 . .	3939	9·988	4691	10·572	3599	10·757	8797	10·064
20 ... 25 . .	3497	8·867	3842	8·658	3077	9·197	9476	10·840
25 ... 30 . .	3135	7·949	3166	7·135	2507	7·493	8006	9·159
30 ... 40 .	4880	12·374	5307	11·960	4090	12·225	12406	14·192
40 ... 50 . .	3474	8·809	4119	9·283	3084	9·218	7720	8·832
50 ... 60 . .	2646	6·709	3131	7·056	2130	6·367	4810	5·503
60 & upwards .	2935	7·442	3582	8·073	2223	6·645	5022	5·745
Total . . .	39437		44373		33456		87414	
Ages unknown	188		55		352		455	
Grand Total .	39625		44428		33808		87869	

TABLE V.—(*continued.*)

Population of England and Wales.—1841.—*Males.*

Age.	MERIONETH.		MONTGOMERY.		PEMBROKE.		RADNOR.	
	Population.	Per centage to the total living.	Population.	Per centage to the total living.	Population.	Per centage to the total living.	Population.	Per centage to the total living.
Under 15 . .	7027	36·481	12932	37·763	16175	40·317	4731	36·949
15...20 . .	1817	9·433	3547	10·358	4067	10·137	1305	10·192
20...25 . .	1611	8·364	2850	8·322	3160	7·877	1217	9·505
25...30 . .	1515	7·865	2359	6·889	2592	6·461	914	7·138
30...40 . .	2342	12·159	3948	11·529	4485	11·179	1359	10·614
40...50 . .	1697	8·810	3089	9·020	3615	9·011	1188	9·278
50...60 . .	1436	7·455	2579	7·531	2649	6·603	937	7·318
60 & upwards .	1817	9·433	2941	8·588	3376	8·415	1153	9·005
Total . .	19262		34245		40119		12804	
Ages unknown	17		38		131		22	
Grand Total .	19279		34283		40250		12826	

Age.	MALES.—ENGLAND AND WALES.		FEMALES.—ENGLAND AND WALES.	
	Population.	Per centage to the total living.	Population.	Per centage to the total living.
Under 15 . .	2938464	36·693	2924959	34·913
15...20 . .	805646	10·064	828311	9·887
20...25 . .	781450	9·758	859634	10·261
25...30 . .	613999	7·667	698583	8·338
30...40 . .	1040626	12·994	1090191	13·013
40...50 . .	773141	9·654	802578	9·580
50...60 . .	509258	6·359	544528	6·500
60 & upwards .	545510	6·812	628928	7 854
Total . .	8008094		8377712	

The peculiar results arising out of the three preceding Tables, and the influence which a difference in the distribution of the population according to age has in altering the apparent ratio of crime to the population, when the element of age does not enter into the inquiry, will at once become evident. In Tables I and II it was shewn that the tendency to crime at some periods of life was more than quadruple that at other periods; and by Table V it appears, that the ratio of the population alive at the respective periods differs widely in the several counties. In Anglesea, Carmarthen, and Dorset, the proportion of the population alive at the quinquennial term of life 20 to 25, is under 8 per cent. of the whole; but in the counties of Lancaster, Middlesex, and Monmouth, the proportion varies

[from 10 per cent.

Table VI.

Criminal Offenders in each County of England and Wales during 1842, 1843, *and* 1844.—*Males.*

Counties.		Aged under 15 years.	Aged 15 years and under 20.	Aged 20 years and under 25.	Aged 25 years and under 30.	Aged 30 years and under 40.	Aged 40 years and under 50.	Aged 50 years and under 60.	Aged 60 years and upwards.	Ages not known.	Total.
Bedford . . .	1842	6	42	64	32	29	13	10	6	1	203
	1843	8	31	37	35	33	27	5	2	2	180
	1844	13	42	39	19	31	16	5	3	...	168
Total		27	115	140	86	93	56	20	11	3	551
Average . . .		9	38	47	29	31	19	7	4	...	184
Berks	1842	12	60	59	31	55	36	16	5	4	278
	1843	17	56	71	37	47	19	5	5	28	285
	1844	8	57	66	35	37	21	15	4	...	243
Total		37	173	196	103	139	76	36	14	32	806
Average . . .		12	58	65	34	46	25	12	5	...	269
Bucks	1842	4	51	81	45	39	17	9	5	3	254
	1843	11	61	76	39	56	26	4	7	2	282
	1844	14	68	49	43	49	17	14	4	5	263
Total		29	180	206	127	144	60	27	16	10	799
Average . . .		10	60	69	42	48	20	9	5	...	266
Cambridge . .	1842	9	47	64	30	35	18	8	1	1	213
	1843	12	48	59	29	43	16	11	2	4	224
	1844	11	47	75	53	29	25	11	1	3	255
Total		32	142	198	112	107	59	30	4	8	692
Average . . .		11	47	66	37	36	20	10	1	...	231
Chester . . .	1842	50	196	220	134	169	76	48	18	4	915
	1843	61	158	177	133	163	79	41	25	11	848
	1844	73	127	145	100	84	62	21	16	2	630
Total		184	481	542	367	416	217	110	59	17	2393
Average . . .		61	160	181	122	139	72	37	20	...	798
Cornwall . . .	1842	14	46	51	35	32	16	7	6	8	215
	1843	18	48	54	33	41	17	8	7	...	226
	1844	16	49	45	34	32	24	9	2	2	213
Total		48	143	150	102	105	57	24	15	10	654
Average . . .		16	48	50	34	35	19	8	5	...	218
Cumberland . .	1842	2	16	12	10	16	10	4	5	1	76
	1843	4	11	12	12	12	8	9	3	...	71
	1844	6	9	17	21	20	14	4	4	3	98
Total		12	36	41	43	48	32	17	12	4	245
Average . . .		4	12	14	14	16	11	6	4	...	82

TABLE VI.—(*continued.*)

COUNTIES.		Aged under 15 years.	Aged 15 years and under 20.	Aged 20 years and under 25.	Aged 25 years and under 30.	Aged 30 years and under 40	Aged 40 years and under 50.	Aged 50 years and under 60.	Aged 60 years and upwards.	Ages not known.	Total.
DERBY	1842	10	32	83	45	57	37	15	8	9	296
	1843	6	46	67	61	65	23	6	7	7	288
	1844	7	42	59	45	49	19	14	7	4	246
Total		23	120	209	151	171	79	35	22	20	830
Average		8	40	70	50	57	26	12	7	...	277
DEVON	1842	20	110	126	88	89	49	22	13	5	522
	1843	21	125	136	98	105	45	25	6	2	563
	1844	35	96	143	101	91	61	23	13	1	564
Total		76	331	405	287	285	155	70	32	8	1649
Average		25	110	135	96	95	52	23	11	...	550
DORSET	1842	7	44	47	30	38	11	9	13	8	207
	1843	6	43	48	30	43	12	8	10	10	210
	1844	8	31	41	17	26	18	5	5	11	162
Total		21	118	136	77	107	41	22	28	29	579
Average		7	39	45	26	36	14	7	9	...	193
DURHAM	1842	16	38	45	44	33	22	4	4	3	209
	1843	7	52	59	42	47	18	4	4	9	242
	1844	13	61	86	55	46	30	13	5	2	311
Total		36	151	190	141	126	70	21	13	14	762
Average		12	50	63	47	42	23	7	4	...	254
ESSEX	1842	24	155	189	99	102	56	27	13	8	673
	1843	33	147	151	88	106	48	17	15	6	611
	1844	34	133	114	69	88	39	16	6	8	507
Total		91	435	454	256	296	143	60	34	22	1791
Average		30	145	151	85	99	48	20	11	...	597
GLOUCESTER	1842	98	267	226	131	150	71	42	14	32	1031
	1843	104	253	208	122	141	70	30	19	15	962
	1844	65	245	206	105	118	65	34	15	20	873
Total		267	765	640	358	409	206	106	48	67	2866
Average		89	255	213	119	136	69	35	16	...	955
HEREFORD	1842	8	24	50	57	33	19	13	6	...	210
	1843	7	30	53	38	35	17	6	7	...	193
	1844	4	35	56	35	37	12	5	5	3	192
Total		19	89	159	130	105	48	24	18	3	595
Average		6	30	53	43	35	16	8	6	...	198
HERTFORD	1842	16	58	76	44	64	29	9	4	4	304
	1843	8	40	75	41	34	20	12	7	4	241
	1844	5	55	66	32	53	20	4	3	6	244
Total		29	153	217	117	151	69	25	14	14	789
Average		10	51	72	39	50	23	8	5	...	263

TABLE VI.—*(continued.)*

COUNTIES.		Aged under 15 years.	Aged 15 years and under 20.	Aged 20 years and under 25.	Aged 25 years and under 30.	Aged 30 years and under 40.	Aged 40 years and under 50.	Aged 50 years and under 60.	Aged 60 years and upwards.	Ages not known.	Total.
HUNTINGDON . .	1842	2	13	17	11	11	3	...	1	2	60
	1843	4	10	12	12	12	3	2	2	1	58
	1844	1	14	20	13	8	6	2	...	...	64
Total		7	37	49	36	31	12	4	3	3	182
Average . . .		2	12	16	12	10	4	1	1	...	61
KENT	1842	41	209	234	138	163	99	36	23	29	972
	1843	34	198	212	117	137	67	36	18	11	830
	1844	31	169	214	137	105	54	17	17	11	755
Total		106	576	660	392	405	220	89	58	51	2557
Average . . .		35	192	220	131	135	73	30	19	...	852
LANCASTER . .	1842	208	759	861	589	652	280	91	42	68	3550
	1843	155	613	658	446	494	272	95	27	70	2830
	1844	191	540	497	310	359	175	61	33	38	2204
Total		554	1912	2016	1345	1505	727	247	102	176	8584
Average . . .		185	637	672	448	502	242	82	34	...	2861
LEICESTER . .	1842	29	90	108	66	72	32	11	14	1	423
	1843	21	115	114	75	82	30	10	14	3	454
	1844	26	111	98	57	70	37	12	7	7	425
Total		76	316	320	198	224	89	33	35	11	1302
Average . . .		25	105	107	66	75	30	11	12	...	434
LINCOLN . . .	1842	5	66	107	89	73	32	15	7	13	407
	1843	11	90	143	68	91	42	16	6	10	477
	1844	16	70	138	86	80	38	10	2	10	450
Total		32	226	388	243	244	112	41	15	33	1334
Average . . .		11	75	129	81	81	37	14	5	...	445
MIDDLESEX .	1842	240	878	710	387	441	231	81	51	86	3105
	1843	307	991	725	381	418	222	91	32	113	3280
	1844	238	869	694	373	406	228	129	42	100	3079
Total		785	2738	2129	1141	1265	681	301	125	299	9464
Average . . .		262	913	710	380	422	227	100	42	...	3155
MONMOUTH . .	1842	7	34	44	38	51	22	12	2	3	213
	1843	7	31	57	41	43	14	5	4	6	208
	1844	4	38	51	31	39	13	6	9	10	201
Total		18	103	152	110	133	49	23	15	19	622
Average . . .		6	34	51	37	44	16	8	5	...	207
NORFOLK . . .	1842	67	180	166	84	91	47	29	13	4	681
	1843	31	179	162	93	112	44	20	15	9	665
	1844	63	168	164	91	72	45	26	19	13	661
Total		161	527	492	268	275	136	75	47	26	2007
Average . . .		54	176	164	89	92	45	25	16	...	669

TABLE VI.—(*continued.*)

COUNTIES.		Aged under 15 years.	Aged 15 years and under 20.	Aged 20 years and under 25.	Aged 25 years and under 30.	Aged 30 years and under 40.	Aged 40 years and under 50.	Aged 50 years and under 60.	Aged 60 years and upwards.	Ages not known.	Total.
NORTHAMPTON . .	1842	19	56	79	35	55	25	14	6	19	308
	1843	6	38	81	47	34	19	8	7	5	245
	1844	9	43	65	52	39	29	10	6	7	260
Total		34	137	225	134	128	73	32	19	31	813
Average . . .		11	46	75	45	43	24	11	6	...	271
NORTHUMBERLAND	1842	18	50	46	22	34	14	7	...	2	193
	1843	28	55	45	24	27	10	8	4	23	224
	1844	19	42	57	31	30	14	4	3	17	217
Total		65	147	148	77	91	38	19	7	42	634
Average . . .		22	49	49	26	30	13	6	2	...	211
NOTTINGHAM . .	1842	10	75	87	52	51	27	12	3	8	325
	1843	18	64	105	32	53	23	8	6	1	310
	1844	28	67	71	38	47	32	11	1	2	297
Total		56	206	263	122	151	82	31	10	11	932
Average . . .		19	69	88	41	50	27	10	3	...	311
OXFORD . . .	1842	15	56	66	43	58	26	13	5	4	286
	1843	15	35	77	53	50	21	7	9	9	276
	1844	15	54	68	40	40	20	6	6	10	259
Total		45	145	211	136	148	67	26	20	23	821
Average . . .		15	48	70	45	49	22	9	7	...	274
RUTLAND . . .	1842	1	2	17	9	7	4	4	...	...	44
	1843	1	3	12	5	5	4	...	...	2	32
	1844	...	3	3	2	9	2	...	1	...	20
Total		2	8	32	16	21	10	4	1	2	96
Average . . .		1	3	11	5	7	3	1	...	...	32
SALOP	1842	18	74	98	56	78	35	23	10	3	395
	1843	20	87	93	80	85	45	17	13	5	445
	1844	19	61	87	54	66	39	23	15	1	365
Total		57	222	278	190	229	119	63	38	9	1205
Average . . .		19	74	93	63	76	40	21	13	...	402
SOMERSET . . .	1842	52	219	237	144	143	61	32	14	80	982
	1843	51	204	214	117	106	54	24	26	35	831
	1844	47	238	221	122	98	51	33	20	49	879
Total		150	661	672	383	347	166	89	60	164	2692
Average . . .		50	220	224	128	116	55	30	20	...	897
SOUTHAMPTON . .	1842	27	109	149	83	102	45	38	16	6	575
	1843	24	115	150	92	87	48	19	10	7	552
	1844	28	87	122	74	45	33	18	10	7	424
Total		79	311	421	249	234	126	75	36	20	1551
Average . . .		26	104	140	83	78	42	25	12	...	517

TABLE VI.—*(continued.)*

COUNTIES.		Aged under 15 years.	Aged 15 years and under 20.	Aged 20 years and under 25.	Aged 25 years and under 30.	Aged 30 years and under 40.	Aged 40 years and under 50.	Aged 50 years and under 60.	Aged 60 years and upwards.	Ages not known.	Total.
STAFFORD . . .	1842	58	238	355	202	252	100	43	26	21	1295
	1843	45	166	244	189	151	71	40	17	55	978
	1844	44	125	169	113	136	60	32	12	19	710
Total		147	529	768	504	539	231	115	55	95	2983
Average . . .		49	176	256	168	180	77	38	18	...	994
SUFFOLK . . .	1842	22	85	135	55	76	36	18	11	9	447
	1843	39	111	142	79	75	32	18	12	9	517
	1844	18	153	145	78	74	33	15	12	10	538
Total		79	349	422	212	225	101	51	35	28	1502
Average . . .		26	116	141	71	75	34	17	12	...	501
SURREY	1842	49	194	200	124	106	58	31	10	9	781
	1843	34	167	182	104	97	54	30	12	10	690
	1844	49	225	194	103	87	33	28	14	14	747
Total		132	586	576	331	290	145	89	36	33	2218
Average . . .		44	195	192	110	97	48	30	12	...	739
SUSSEX	1842	19	109	126	65	79	36	21	14	...	469
	1843	32	97	88	53	71	43	14	10	2	410
	1844	22	70	77	45	66	32	19	9	...	340
Total		73	276	291	163	216	111	54	33	2	1219
Average . . .		24	92	97	54	72	37	18	11	...	406
WARWICK . . .	1842	60	230	206	105	141	72	18	13	1	846
	1843	75	256	211	109	129	51	19	11	7	868
	1844	54	191	183	120	122	59	26	12	8	775
Total		189	677	600	334	392	182	63	36	16	2489
Average . . .		63	226	200	111	131	61	21	12	...	830
WESTMORELAND .	1842	...	3	7	10	5	2	1	1	1	30
	1843	2	5	13	7	3	3	...	1	...	34
	1844	1	4	5	2	5	...	1	...	...	18
Total		3	12	25	19	13	5	2	2	1	82
Average . . .		1	4	8	6	4	2	1	1	...	27
WILTS	1842	20	123	122	69	84	35	22	10	6	491
	1843	14	92	105	56	75	32	15	8	2	399
	1844	25	84	97	44	59	32	19	7	6	373
Total		59	299	324	169	218	99	56	25	14	1263
Average . . .		20	100	108	56	73	33	19	8	...	421
WORCESTER . .	1842	23	117	110	86	85	33	24	7	22	507
	1843	32	117	159	95	91	48	17	3	13	575
	1844	30	115	134	70	82	45	26	9	11	516
Total		85	349	403	251	258	126	61	19	46	1598
Average . . .		28	116	134	84	86	42	20	6	...	533

TABLE VI.—(*continued.*)

COUNTIES.	Aged under 15 years.	Aged 15 years and under 20.	Aged 20 years and under 25.	Aged 25 years and under 30.	Aged 30 years and under 40.	Aged 40 years and under 50.	Aged 50 years and under 60.	Aged 60 years and upwards.	Ages not known.	Total.
YORK 1842	105	399	580	427	398	179	80	26	24	2218
1843	78	415	543	337	328	124	53	31	20	1929
1844	76	298	332	246	226	100	46	28	16	1368
Total	259	1112	1455	1010	952	403	179	85	60	5515
Average . . .	86	371	485	337	317	134	60	28	...	1838
ANGLESEA . . . 1842	...	2	3	2	3	4	2	1	...	17
1843	...	2	4	1	4	...	1	...	4	16
1844	...	3	...	1	1	...	...	...	1	6
Total	...	7	7	4	8	4	3	1	5	39
Average . . .	...	2	2	1	3	1	1	...	...	13
BRECON 1842	...	4	14	12	9	10	2	2	...	53
1843	2	7	12	9	12	11	...	1	2	56
1844	...	4	12	6	12	6	3	...	3	46
Total	2	15	38	27	33	27	5	3	5	155
Average . . .	1	5	13	9	11	9	2	1	...	52
CARDIGAN . . . 1842	1	2	4	3	2	1	...	...	1	14
1843	2	...	3	5	5	1	...	3	3	22
1844	...	2	10	9	1	2	...	...	1	25
Total	3	4	17	17	8	4	...	3	5	61
Average . . .	1	1	6	6	3	1	...	1	...	20
CARMARTHEN . . 1842	2	5	7	3	10	5	2	...	8	42
1843	3	13	24	10	17	15	3	...	76	161
1844	3	6	24	15	18	7	5	2	12	92
Total	8	24	55	28	45	27	10	2	96	295
Average . . .	3	8	18	9	15	9	3	1	...	98
CARNARVON . . 1842	...	4	7	6	5	2	1	1	...	26
1843	2	...	8	2	2	3	...	1	1	19
1844	1	4	9	2	3	...	1	1	4	25
Total	3	8	24	10	10	5	2	3	5	70
Average . . .	1	3	8	3	3	2	1	1	...	23
DENBIGH . . . 1842	3	8	17	12	10	5	...	1	9	65
1843	2	9	23	8	9	9	4	2	7	73
1844	9	11	13	13	9	14	1	2	6	78
Total	14	28	53	33	28	28	5	5	22	216
Average . . .	5	9	18	11	9	9	2	2	...	72
FLINT 1842	1	7	12	4	12	4	1	2	6	49
1843	...	7	8	4	15	7	1	1	3	46
1844	1	5	8	7	14	2	1	1	3	42
Total	2	19	28	15	41	13	3	4	12	137
Average . . .	1	6	9	5	14	4	1	1	...	46

TABLE VI.—*(continued.)*

		Aged under 15 years.	Aged 15 years and under 20.	Aged 20 years and under 25.	Aged 25 years and under 30.	Aged 30 years and under 40.	Aged 40 years and under 50.	Aged 50 years and under 60.	Aged 60 years and upwards.	Ages not known.	Total.
GLAMORGAN . .	1842	12	29	31	28	25	12	4	3	9	153
	1843	5	11	25	32	26	12	6	2	12	131
	1844	6	32	40	25	28	15	7	2	13	168
Total		23	72	96	85	79	39	17	7	34	452
Average . . .		8	24	32	28	26	13	6	2	...	151
MERIONETH . .	1842	2	1	4	...	1	...	2	...	1	11
	1843	...	1	2	4	3	5	1	1	...	17
	1844	1	1	1	2	1	...	1	...	...	7
Total		3	3	7	6	5	5	4	1	1	35
Average . . .		1	1	2	2	2	2	1	...	...	12
MONTGOMERY .	1842	...	8	20	3	7	8	5	3	1	55
	1843	2	16	18	10	13	5	7	2	2	75
	1844	1	16	15	15	14	9	5	5	...	80
Total		3	40	53	28	34	22	17	10	3	210
Average . . .		1	13	18	9	11	7	6	3	...	70
PEMBROKE . .	1842	...	5	10	3	3	3	...	...	2	26
	1843	...	6	14	10	7	2	4	...	27	70
	1844	2	6	9	6	7	4	5	...	2	41
Total		2	17	33	19	17	9	9	...	31	137
Average . . .		1	6	11	6	6	3	3	...	...	46
RADNOR . . .	1842	...	3	3	3	6	4	1	...	...	20
	1843	...	3	5	2	6	1	2	2	1	22
	1844	1	5	4	3	5	4	...	1	2	25
Total		1	11	12	8	17	9	3	3	3	67
Average . . .		...	4	4	3	6	3	1	1	...	22

from 10 per cent. to upwards of 11 per cent. It hence follows, that if even the tendency to crime were precisely the same at the respective terms of life in those districts, there would still be, in reference to the whole population, an apparent excess of crime in the three latter counties, from the fact that they contain a greater proportion of their population at that term of life at which the tendency to crime is the greatest; and, consequently, any method of investigating crime in which the element of age is not introduced, can never shew the relative amount of crime in different districts, nor in the same district at different periods of time.

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Table VII.

Amount of Crime in the following places, assuming the Ratio to be the same as that for England and Wales, during 1842, 1843, *and* 1844.

Males.

Age.	England and Wales. 1841.	England and Wales. 1821.	Metropolis. 1841.	Glasgow. 1841.	United States, America. Males and Females.	Ireland.		Manchester, Birmingham, Leeds, and Sheffield.	Devon, Essex, Suffolk, Norfolk, and Hereford.	Bethnal Green.	St.George's, Hanover Square.	Middlesex.	Cornwall.
						4 Counties where the proportion of mud-hovels is lowest.	4 Counties where the proportion of mud-hovels is highest.						
Under 15 .	1422	1171	140	23	2	92	181	56	155	7	3	118	33
15...20 .	5343	3956	541	94	7	347	683	214	572	24	18	456	120
20...25 .	5565	3582	691	119	8	296	576	240	546	23	29	584	106
25...30 .	3655	2352	493	77	5	232	478	168	352	17	22	417	67
30...40 .	3790	2556	513	72	4	193	377	173	374	19	21	431	71
40...50 .	1874	1371	243	30	2	103	167	78	204	9	9	206	37
50...60 .	841	658	97	10	..	48	89	29	97	4	3	82	17
60 & upwards	434	349	39	4	..	20	26	11	56	2	1	32	9
Total . .	22924	15995	2757	429	28	1331	2577	969	2356	105	106	2326	460
Population .	7771094	5845676	876956	130478	10000	459728	870058	310869	832829	35552	29651	733545	164295
Proportion, 1 in	339	365	314	304	357	345	338	321	353	338	280	315	357

TABLE VII.—*(continued.)*

Age.	Bedford.	Berks.	Bucks.	Cambridge.	Cheshire.	Cornwall.	Cumberland.	Derby.	Devon.	Dorset.	Durham.	Essex.	Gloucester.
Under 15 . .	10	15	14	15	36	33	16	25	47	16	30	32	37
15...20 . .	36	54	53	56	139	120	61	94	176	56	112	114	138
20...25 . .	35	55	50	61	142	106	60	93	164	51	122	118	141
25...30 . .	22	35	33	37	92	67	37	63	105	34	79	76	93
30...40 . .	24	38	34	37	94	71	39	65	112	37	77	79	98
40...50 . .	12	19	18	20	44	37	20	32	60	19	35	43	51
50...60 . .	5	9	9	8	19	17	10	15	31	9	15	19	23
60 & upwards ,	3	5	5	4	9	9	5	8	17	6	8	10	12
Total . . .	147	230	216	238	575	460	248	395	712	228	478	491	593
Population . .	52131	79596	76227	81331	192526	164295	85918	135223	252049	83459	159702	171310	204330
Proportion, 1 in	355	346	353	342	334	357	346	342	354	366	334	348	344

Ages.	Hereford.	Hertford.	Huntingdon.	Kent.	Lancaster.	Leicester.	Lincoln.	Middlesex.	Monmouth.	Norfolk.	Northampton.	Northumberland.	Notts.
Under 15 . .	10	15	5	49	150	19	33	118	12	37	18	22	23
15...20 . .	38	54	21	183	582	74	125	456	47	138	70	84	81
20...25 . .	37	53	21	198	624	70	129	584	61	128	69	90	79
25...30 . .	25	34	13	118	416	46	82	417	40	81	43	58	53
30...40 . .	27	36	13	127	432	49	83	431	38	89	46	59	59
40...50 . .	15	18	7	63	189	26	44	206	17	50	24	28	30
50...60 . .	7	8	3	31	76	12	20	82	7	22	11	13	14
60 & upwards .	4	5	2	18	32	7	11	32	3	14	6	7	7
Total. . .	163	223	85	787	2501	303	527	2326	225	559	287	361	346
Population . .	56866	77120	28945	269484	813077	105477	180466	733545	70467	198772	98662	120872	121381
Proportion, 1 in	319	346	341	342	325	348	342	315	313	356	344	335	351

TABLE VII.—*(continued.)*

Age.	Oxford.	Rutland.	Salop.	Somerset.	Southampton.	Stafford.	Suffolk.	Surrey.	Sussex.	Warwick.	Westmoreland.	Wilts.	Worcester.
Under 15 . .	15	2	21	39	32	49	29	49	28	35	5	24	21
15...20 . .	55	8	84	148	119	179	106	171	96	131	21	91	75
20...25 . .	57	7	82	178	125	190	100	196	96	142	20	88	78
25...30 . .	34	4	54	90	79	129	63	138	62	96	12	53	52
30...40 . .	36	5	56	95	79	126	68	148	68	98	12	56	55
40...50 . .	19	3	29	51	41	58	36	73	35	48	7	31	28
50...60 . .	9	1	14	24	21	25	17	31	16	20	3	14	12
60 & upwards .	5	0	8	14	11	12	11	14	9	10	2	9	7
Total . . .	230	30	348	639	507	768	430	820	410	580	82	366	328
Population . .	80176	10659	119037	208918	174344	257586	153832	275207	146552	194782	28074	127454	114249
Proportion, 1 in	348	355	342	327	344	335	358	336	357	335	342	348	348

Age.	York.	Anglesea.	Brecon.	Cardigan.	Carmarthen.	Carnarvon.	Denbigh.	Flint.	Glamorgan.	Merioneth.	Montgomery.	Pembroke.	Radnor.
Under 15 . .	147	5	5	6	10	7	8	6	15	3	6	8	2
15...20 . .	565	16	19	23	36	27	32	25	60	12	24	28	9
20...25 . .	570	15	21	20	31	27	30	24	73	12	22	24	9
25...30 . .	371	0	14	13	20	19	19	15	48	9	14	16	5
30...40 . .	371	10	14	14	22	19	20	16	47	9	15	17	5
40...50 . .	181	6	6	7	11	9	10	8	19	4	8	9	3
50...60 . .	83	3	3	4	6	4	5	4	8	2	4	4	2
60 & upwards .	41	2	2	2	3	2	3	2	4	1	2	3	1
Total . . .	2329	57	84	89	139	114	127	100	274	52	95	109	36
Population . .	785409	24293	28023	32183	50567	39437	44373	33456	87414	19262	34215	40119	12804
Proportion, 1 in	337	363	334	362	363	346	349	335	319	370	360	368	355

Still further to establish this truth, Table VII has been constructed on the hypothesis, that in the various counties and districts the tendency to crime was the same as prevailed in England and Wales during the years 1842, 1843, and 1844, as represented in Table I. The actual populations of those places were taken as given in Table III. In Table I it will be seen that the actual proportion of male criminals in England and Wales during those three years was one in every 336 of the whole male population. If the population of the kingdom, however, during those years, had been under the same distribution in regard to age as in the year 1821, the proportion of criminals would have been one in every 365 only of the population; but, on the other hand, if under the same distribution as the city of Glasgow, crime would appear to have been as high as one in every 304. Again, the difference of distribution of even two districts in the metropolis is such as to produce in Bethnal Green the proportion of one in 338, while in St. George's, Hanover Square, the ratio would be as high as one in 280; shewing a difference or error in the method of inquiry thus resorted to, of about 21 per cent. An inspection of the results for the several counties will furnish evidence of similar irregularities. In Anglesea, Cardigan, Carmarthen, Dorset, Merioneth, Montgomery, and Pembroke, the ratio of crime is one in 360 and upwards; but in Glamorgan, Lancaster, Middlesex, and Monmouth, the average is from one in 325 to one in 313, being a difference of at least 18 per cent. It is therefore evident that the element of age is an essential item in every inquiry or investigation into the relative amount and progress of crime in different districts, and that calculations in which that element is neglected cannot be relied on; for we have here examples of districts in which the same ratio of crime is assumed to prevail, and yet there would appear to be an excess of crime in some places of 20 per cent. above that which would seem to prevail in others.

The arguments and illustrations now brought forward to shew the necessity of viewing age as an element in all inquiries into the prevalence of crime, it will be seen, apply with equal force to the question of sex.

Over the whole male population of the country, the tendency to crime is nearly five times as great as in the female sex; and since in some districts of the country the proportion of the population of the two sexes at the various periods of life is very different, the results of any inquiry in which the sexes are not distinguished must be subject to very great fallacies, shewing errors to a greater extent than even those connected with the element of age, as that element would equally affect the present case, and be further vitiated by the disturbing influence of sex. It is therefore obvious, that in every properly conducted inquiry in criminal statistics, a separate analysis must be made for each sex.

Some very curious and interesting features will be found to connect themselves with Tables I and II, and also Tables XXII and XXIII. From the age of 20 it will be found that in the male sex, crime, in each successive term of life given in the Tables, decreases

at the rate of 33·333 per cent., and in the female sex, at the rate of 25 per cent.; so that if two Tables were formed, in one of which the numbers resulting from such a law were given, and in the other the actual number of criminals, the one Table, particularly in reference to the female sex, would be almost identical with the other. The following Abstract will shew the ratio of criminals according to the actual results for England and Wales during the years 1842–4, and also during the years 1845–8, as well as according to the theoretical law just alluded to; and in regard to the years 1842–4, it will be seen that in only one of the terms of the male sex is there any material difference between the two classes of results, while for the female sex, the actual and the theoretical results are almost identical throughout the whole of the Table.

Proportion per cent. of Crime to the Population.

Age.	Males.				Females.			
	Actual Results. Tables I and XXII.		Law.		Actual Results. Tables II and XXIII.		Law.	
	1842–4.	1845–8.	1842–4.	1845–8.	1842–4.	1845–8.	1842–4.	1845–8.
20 to 25	·7702	·6702	·8536	·7290	·1459	·1506	·1452	·1497
25 ... 30	·5989	·5141	·5691	·4860	·1141	·1240	·1089	·1123
30 ... 40	·3794	·3240	·3794	·3240	·0817	·0842	·0817	·0842
40 ... 50	·2504	·2222	·2529	·2160	·0643	·0609	·0613	·0632
50 ... 60	·1694	·1334	·1686	·1440	·0466	·0385	·0460	·0474

In statistical inquiries the discovery of any such law as that now pointed out is of the first importance, for it gives evidence of the existence of some very powerful and intense element connected with the determination of the particular class of results, and but little influenced or disturbed by external circumstances; which, if once clearly exhibited, may admit of such modifications in its conditions as will lead to practical and highly beneficial modes of administration, tending to elevate the moral and political condition of the people. It is only from a properly determined series of results, developing general principles in the truth and safety of which confidence can be placed, that any effective legislation can result; and without the appearance of some numerical laws, those principles themselves must remain comparatively obscure, and legislation continue impeded. It will be found that this theoretical law is not peculiar to the periods of years to which the preceding facts relate, but is a proper and distinctive feature in the conditions of society under which crime appears in other years. The preceding Abstract has relation to the years 1842–8 only, because prior to the year 1842, the Criminal Returns published by the Home Office gave the ages of criminals for a division of ages which could not be assimilated with the periods of life recognised in the census; and to have introduced them would only have lessened the value of the facts now presented; but from the following Abstract it will be seen, that so far as the Criminal Returns for the four years 1838–1841 go, traces of the same law of crime are clearly observable.

Age.	Males.					Mean of 4 years.	Per cent. to whole Population of		Mean of 4 years.	Females.				
	1838.	1839.	1840.	1841.	Total.		Males.	Females.		Total.	1841.	1840.	1839.	1838.
Under 12 .	317	363	409	416	1505	376	...	...	68	272	82	80	61	49
12...16 .	1933	2062	2177	2240	8412	2103	...	...	428	1711	474	477	402	358
16...21 .	5562	5602	6239	6188	23591	5898	·7587	·1621	1303	5212	1385	1403	1259	1165
21...30 .	5935	6184	6815	7286	26220	6555	·4939	·0992	1484	5935	1625	1609	1421	1280
30...40 .	2733	2935	3366	3413	12447	3112	·3129	·0723	759	3038	849	800	716	673
40...50 .	1226	1300	1495	1543	5564	1391	·1867	·0551	428	1714	451	465	402	396
50...60 .	545	612	656	656	2469	617	·1249	·0331	175	700	175	194	185	146
60 & upwards	289	298	342	332	1261	315	...	...	83	331	86	87	81	77
Unknown .	365	475	476	486	1802	450	...	...	75	300	73	97	85	45

It must thus appear evident that whatever means may be employed for the prevention of crime, or the treatment of criminals, ought to shew their influence and bearing on the male sex chiefly between the ages of 20 and 25. The following Abstract from Tables I and II and XXII and XXIII will shew the relative tendency to crime in the two sexes at the various terms of life.

Age.	Ratio per cent. of Criminals to the Population, yearly.				Number of the Population to which there is one crime yearly.				Excess per cent. of Crime among Males.	
	Males.		Females.		Males.		Females.			
	1842-4.	1845-8.	1842-4.	1845-8.	1842-4.	1845-8.	1842-4.	1845 8.	1842-4.	1845-8.
Under 15 .	·0494	·0432	·0080	·0072	2024·7	2315·2	12500·0	13913·3	517·4	500·9
15...20 .	·6841	·6404	·1495	·1498	146·2	156·1	668·9	667·7	357·5	327·7
20...25 .	·7702	·6702	·1459	·1506	129·8	149·2	770·4	664·1	493·5	345·1
25...30 .	·5989	·5141	·1141	·1240	167·0	194·5	876·4	806·4	424·8	314·6
30...40 .	·3794	·3240	·0817	·0842	263·6	308·6	1224·0	1188·2	364·3	285·0
40...50 .	·2504	·2222	·0643	·0609	399·4	450·0	1555·2	1160·9	289·4	158·0
50...60 .	·1694	·1334	·0466	·0385	590·3	749·8	2145·9	2596·9	263·5	246·3
60 & upwards	·0813	·0688	·0186	·0157	1230·0	145·4	5373·5	6379·3	336·8	428·7

It will be observed that in the male sex the tendency to crime at ages 15–20 is somewhat less than in the next quinquennial period of life; but a similar result does not appear for the female sex during the period 1842–4, as the tendency to crime at those two periods of life is nearly equal. In the Home Office Returns the ages of the offenders under 15 years is not distinguished; but if the age of criminals under 15 be held to be between the ages of 10–15, it will alter the expressions at that term of life in Tables I and II, and in the corresponding columns of the above Abstract from ·0494 per cent. to ·1607 per cent. for the male sex, and from ·0080 per cent. to ·0266 per cent. for the female sex, and a similar modification will be necessary in respect to the results derived from Tables XXII and XXIII.

In Table VI preceding is given the number of criminal offenders in each county of England and Wales, at the respective terms of life recognised in the Home Office Returns, for each of the years 1842, 1843, and 1844; also the total number of criminals in the various counties, at each term of life for the three years, as well as the average number for the three years.

The next Table to which attention is directed (Table VIII) is one of some importance, as it shews the actual yearly average number of criminals in each county of England and Wales, during the years 1842, 1843, and 1844, and for every term of life. In a parallel column is given what would have been the number of criminals at the same terms of life, provided the same tendency to crime had prevailed in each county as over the whole kingdom. A comparison of the parallel columns will at once shew, whether the actual crime in any county be above or below the average of the whole kingdom, and also at what term of life the increase or decrease of crime prevails. A further analysis of the same facts will be found in Table XI, in which a correction is applied for the increase of population to the mean times of the years 1842, 1843, and 1844; and in the last column of that Table will be found the difference per cent. between the actual amount of crime in each county, and that which would have resulted if the same tendency to crime had prevailed as over the whole of England and Wales.

Having thus found the actual amount of crime in each county, in relation to the ages of the population, as well as the average crime in each county at the same ages, according to the ratio for the whole kingdom, and observed the marked differences in the amount of crime in various districts,—some having an excess of crime of more than 52 per cent. above the average of the country, while other districts are below the average by at least 80 per cent.;—it becomes an important problem for solution, to discover, if possible, the nature and character of that element in the condition of the respective districts which produces so remarkable a disparity, and exercises so powerful an influence in the development of crime.

Various methods suggest themselves of effecting such an analysis as might possibly lead to the discovery of any agent, so materially influencing the moral and social state of society. The first arrangement adopted is that supposed to connect itself with the manufacturing or agricultural interest of a district. In Table IX the manufacturing and mining counties are divided into four groups,—the northern mining districts; the cotton and woollen manufacturing districts; the cotton, woollen, silk, and lace-fabric districts; and the hardware, pottery, and glass manufacturing districts. Again, the agricultural counties will be found to be divided into three groups,—the North-Eastern and Eastern, the Midland, and the South and South-Western districts. In each of these combinations the actual number of criminals at the respective periods of life is shewn, as well as the number that would result in those districts at the same ages, if the same tendency to crime prevailed as over the whole of the kingdom.

In Table XII the same facts will be found under a more convenient arrangement.

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Table VIII.

Shewing the actual amount of Crime in each County, according to the average of the years 1842, 1843, *and* 1844 *; and also the calculated amount supposing the ratio to be the same as that for the whole of England and Wales during the same years.—Males.*

Age.	Bedford.		Berks.		Bucks.		Cambridge.		Cheshire.		Cornwall.		Cumberland.	
	Number.		Number.		Number.		Number.		Number.		Number.		Number.	
	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.
Under 15 . .	10	9	15	12	14	10	15	11	36	61	33	16	16	4
15...20 . .	36	38	54	58	53	60	56	47	139	160	120	48	61	12
20...25 . .	35	47	55	65	50	69	61	66	142	181	106	50	60	14
25...30 . .	22	29	35	34	33	42	37	37	92	122	67	34	37	14
30...40 . .	24	31	38	46	34	48	37	36	94	139	71	35	39	16
40...50 . .	12	19	19	25	18	20	20	20	44	72	37	19	20	11
50...60 . .	5	7	9	12	9	9	8	10	19	37	17	8	10	6
60 and upwards	3	4	5	5	5	5	4	1	9	20	9	5	5	4
Total . . .	147	184	230	257	216	263	238	228	557	792	460	215	248	81
Population . .	52131	...	79596	...	76227	...	81331	...	192526	...	164295	...	85918	...
Proportion;–1 in	355	283	346	317	353	290	342	357	334	243	357	764	346	1061

	Derby.		Devon.		Dorset.		Durham.		Essex.		Gloucester.		Hereford.	
Under 15 . .	25	8	47	25	16	7	30	12	32	30	37	89	10	6
15...20 . .	94	40	176	110	56	39	112	50	114	145	138	255	38	30
20...25 . .	93	70	164	135	51	45	122	63	118	151	141	213	37	53
25...30 . .	63	50	105	96	34	26	79	47	76	85	93	119	25	43
30...40 . .	65	57	112	95	37	36	77	42	79	99	98	136	27	35
40...50 . .	32	26	60	52	19	14	35	23	43	48	51	69	15	16
50...60 . .	15	12	31	23	9	7	15	7	19	20	23	35	7	8
60 and upwards	8	7	17	11	6	9	8	4	10	11	12	16	4	6
Total . . .	395	270	712	547	228	183	478	248	491	589	593	932	163	197
Population . .	135223	...	252049	...	83459	...	159702	...	171310	...	204330	...	56866	...
Proportion;–1 in	342	501	354	461	366	456	334	644	348	291	344	219	349	290

TABLE VIII—*(continued)*.

AGE.	HERTFORD.		HUNTS.		KENT.		LANCASTER.		LEICESTER.		LINCOLN.		MIDDLESEX.	
	Number.		Number.		Number.		Number.		Number.		Number.		Number.	
	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.
Under 15 . .	15	10	5	2	49	35	150	185	19	25	33	11	118	262
15...20 . .	54	51	21	12	183	192	582	637	74	105	125	75	456	913
20...25 . .	53	72	21	16	198	220	624	672	70	107	129	129	584	710
25...30 . .	34	39	13	12	118	131	416	448	46	66	83	81	417	380
30...40 . .	36	50	13	10	127	135	432	502	49	75	83	81	431	422
40...50 . .	18	23	7	4	63	73	189	242	26	30	44	37	206	227
50...60 . .	8	8	3	1	31	30	76	82	12	11	20	14	82	100
60 & upwards.	5	5	2	1	18	19	32	34	7	12	11	5	32	42
Total . . .	223	258	85	58	787	835	2501	2802	303	431	527	433	2326	3056
Population . .	77120	...	28945	...	269484	...	813077	...	105477	...	180466	...	733545	...
Proportion;–1 in	346	299	345	499	342	323	325	290	348	245	342	417	315	240

	MONMOUTH.		NORFOLK.		NORTHAMPTON.		NORTHUMBERLAND.		NOTTS.		OXFORD.		RUTLAND.	
Under 15 . .	12	6	37	54	18	11	22	22	23	19	15	15	2	1
15...20 , .	47	34	138	176	70	46	84	49	81	69	55	48	8	3
20...25 . .	61	51	128	164	69	75	90	49	79	88	57	70	7	11
25...30 . .	40	37	81	89	43	45	58	26	53	41	34	45	4	5
30...40 . .	38	44	89	92	46	43	59	30	59	50	36	49	5	7
40...50 . .	17	16	50	45	24	24	28	13	30	27	19	22	3	3
50...60 . .	7	8	22	25	11	11	13	6	14	10	9	9	1	1
60 & upwards .	3	5	14	16	6	6	7	2	7	3	5	7	...	...
Total . . .	225	201	559	661	287	261	361	197	346	307	230	265	30	31
Population . .	70467	...	198772	...	98662	...	120872	...	121381	...	80176	...	10959	...
Proportion;–1 in	313	351	356	301	344	378	335	614	351	395	348	302	355	344

Table VIII—*(continued.)*

Age.	Salop.		Somerset.		Southampton.		Stafford.		Suffolk.		Surrey.	
	Number.		Number.		Number.		Number.		Number.		Number.	
	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.
Under 15 . . .	21	19	39	50	32	26	49	49	29	26	49	44
15...20 . . .	84	74	148	220	119	104	179	176	106	116	171	195
20...25 . . .	82	93	178	224	125	140	190	256	100	141	196	192
25...30 . . .	54	63	90	128	79	83	129	168	63	71	138	110
30...40 . . .	56	76	95	116	79	78	126	180	68	75	148	97
40...50 . . .	29	40	51	55	41	42	58	77	36	34	73	48
50...60 . . .	14	21	24	30	21	25	25	38	17	17	31	30
60 & upwards .	8	13	14	20	11	12	12	18	11	12	14	12
Total . . .	348	399	639	843	507	510	768	962	430	492	820	728
Population . .	119037	...	208918	...	174344	...	257586	...	153832	...	275207	...
Proportion;—1 in	342	298	327	248	344	342	335	268	358	313	336	378

	Sussex.		Warwick.		Westmoreland.		Wilts.		Worcester.		York.	
Under 15 . . .	28	24	35	63	5	1	24	20	21	28	147	86
15...20 . . .	96	92	131	226	21	4	91	100	75	116	565	371
20...25 . . .	96	97	142	200	20	8	88	108	78	134	570	485
25...30 . . .	62	54	96	111	12	6	58	56	52	84	371	337
30...40 . . .	68	72	98	131	12	4	56	73	55	86	371	317
40...50 . . .	35	37	48	61	7	2	31	33	28	42	181	134
50...60 . . .	16	18	20	21	3	1	14	19	12	20	83	60
60 & upwards .	9	11	10	12	2	1	9	8	7	6	41	28
Total . . .	410	405	580	825	82	27	366	417	328	516	2329	1818
Population . .	146552	...	194782	...	28074	...	127454	...	114249	...	785409	...
Proportion;—1 in	357	362	335	236	342	1040	348	306	348	221	337	432

TABLE VIII—*(continued.)*

Age.	Anglesea.		Brecon.		Cardigan.		Carmarthen.		Carnarvon.		Denbigh.	
	Number.		Number.		Number.		Number.		Number.		Number.	
	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.
Under 15 . . .	5	...	5	1	6	1	10	3	7	1	8	5
15...20 . . .	16	2	19	5	23	1	36	8	27	3	32	9
20...25 . . .	15	2	21	13	20	6	31	18	27	8	30	18
25...30 . . .	10	1	14	9	13	6	20	9	19	3	19	11
30...40 . . .	10	3	14	11	14	3	22	15	19	3	20	9
40...50 . . .	6	1	6	9	7	1	11	9	9	2	10	9
50...60 . . .	3	1	3	2	4	...	6	3	4	1	5	2
60 & upwards .	2	...	2	1	2	1	3	1	2	1	3	2
Total . . .	67	10	84	51	89	19	139	66	114	22	127	65
Population . .	24293	...	28023	...	32183	...	50567	...	39437	...	44373	...
Proportion;—1 in	363	2429	334	549	362	1694	363	766	346	1656	349	683

	Flint.		Glamorgan.		Merioneth.		Montgomery.		Pembroke.		Radnor.	
Under 15 . . .	6	1	15	8	3	1	6	1	8	1	2	...
15...20 . . .	25	6	60	24	12	1	24	13	28	6	9	4
20...25 . . .	24	9	73	32	12	2	22	18	24	11	9	4
25...30 . . .	15	5	48	28	9	2	14	9	16	6	5	3
30...40 . . .	16	14	47	26	9	2	15	11	17	6	5	6
40...50 . . .	8	4	19	13	4	2	8	7	9	3	3	3
50...60 . . .	4	1	8	6	2	1	4	6	4	3	2	1
60 & upwards .	2	1	4	2	1	...	2	3	3	...	1	1
Total . . .	100	41	274	139	52	11	95	68	109	36	36	22
Population . .	33456	...	87414	...	19262	...	34245	...	40119	...	12804	...
Proportion;—1 in	335	816	319	629	370	1751	360	504	368	1114	355	582

Table IX.—Males.

Shewing the Actual Amount of Crime for the average of the years 1842, 1843, *and* 1844, *contrasted with the ratio for the whole of England and Wales during the same years in each Group of the Great Northern and Midland Mining and Manufacturing District.*

County and District.	Under 15.		15—20.		20—25.		25—30.		30—40.		40—50.		50—60.		60 & upwards.		Total.	
	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.
Northern Mining District — Cumberland	16	4	61	12	60	14	37	14	39	16	20	11	10	6	5	4	248	81
Northern Mining District — Northumb.	22	22	84	49	90	49	58	26	59	30	28	13	13	6	7	2	361	197
Northern Mining District — Durham.	30	12	112	50	122	63	79	47	77	42	35	23	15	7	8	4	478	248
	68	38	257	111	272	126	174	87	175	88	83	47	38	19	20	10	1087	526
Cotton and Woollen Manufacture — Lancashire.	150	185	582	637	624	672	416	448	432	502	189	242	76	82	32	34	2501	2802
Cotton and Woollen Manufacture — Yorkshire .	147	86	565	371	570	485	371	337	371	317	181	134	83	60	41	28	2329	1818
	297	271	1147	1008	1194	1157	787	785	803	819	370	376	159	142	73	62	4830	4620
Cotton, Woollen, Silk, and Lace Fabrics — Chester. .	36	61	139	160	142	181	92	122	94	139	44	72	19	37	9	20	575	792
Cotton, Woollen, Silk, and Lace Fabrics — Derby . .	25	8	94	40	93	70	63	50	65	57	32	26	15	18	8	7	395	276
Cotton, Woollen, Silk, and Lace Fabrics — Nottingham	23	19	81	69	79	88	53	41	59	50	30	27	14	10	7	3	346	307
Cotton, Woollen, Silk, and Lace Fabrics — Leicester .	19	25	74	105	70	107	46	66	49	75	26	30	12	11	7	12	303	431
	103	113	388	374	384	446	254	279	267	321	132	155	60	76	31	42	1619	1806
Hardware, Pottery, and Glass Manufacture — Stafford. .	49	49	179	176	190	256	129	168	126	180	58	77	25	38	12	18	768	962
Hardware, Pottery, and Glass Manufacture — Warwick .	35	63	131	226	142	200	96	111	98	131	48	61	20	21	10	12	580	825
Hardware, Pottery, and Glass Manufacture — Worcester .	21	28	75	116	78	134	52	84	55	86	28	42	12	20	7	6	328	516
	105	140	385	518	410	590	277	363	279	397	134	180	57	79	29	36	1676	2303
Total, forming the Great Northern and Midland Mining and Manufacturing District	573	562	2177	2011	2260	2319	1492	1514	1524	1625	719	758	314	316	153	150	9212	9255

TABLE IX.—MALES.—*(continued.)*

For the Agricultural Counties.

COUNTY AND DISTRICT.		Under 15.		15—20.		20—25.		25—30.		30—40.		40—50.		50—60.		60 & upwards.		Total.	
		Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.
North-Eastern and Eastern	Lincoln	33	11	125	75	129	129	82	81	83	81	44	37	20	14	11	5	527	433
	Norfolk	37	54	138	176	128	164	81	89	89	92	50	45	22	25	14	16	559	661
	Suffolk	29	26	106	116	100	141	63	71	68	75	36	34	17	17	11	12	430	492
	Essex	32	30	114	145	118	151	76	85	79	99	43	48	19	20	10	11	491	589
		131	121	483	512	475	585	302	326	319	347	173	164	78	76	46	44	2007	2175
Midland	Cambridge	15	11	56	47	61	66	37	37	37	36	20	20	8	10	4	1	238	228
	Northampton	18	11	70	46	69	75	43	45	46	43	24	24	11	11	6	6	287	261
	Hertford	15	10	54	51	53	72	31	39	36	50	18	23	8	8	5	5	223	258
	Bedford	10	9	36	38	35	47	22	29	24	31	12	19	5	7	3	4	147	184
	Bucks	14	10	53	60	50	69	33	42	34	48	18	20	9	9	5	5	216	263
	Oxford	15	15	55	48	57	70	34	45	36	49	19	22	9	9	5	7	230	265
	Berks	15	12	54	58	55	65	35	34	38	46	19	19	9	12	5	5	230	251
		102	78	378	348	380	464	238	271	251	303	130	147	59	66	33	33	1571	1710
Southern and South-Western	Sussex	28	24	96	92	96	97	62	54	68	72	35	37	16	18	9	11	410	405
	Hants	32	26	119	104	125	140	79	83	79	78	41	42	21	25	11	12	507	510
	Wilts	24	20	91	100	88	108	53	56	56	73	31	40	14	19	9	8	366	424
	Dorset	16	7	56	39	51	45	34	26	37	36	19	14	9	7	6	9	228	183
	Somerset	39	50	148	220	178	224	90	128	95	116	51	55	24	30	14	20	639	843
		139	127	510	555	538	614	318	347	335	375	177	188	84	99	49	60	2150	2365
Total of the Agricultural Counties		372	326	1371	1415	1393	1663	858	944	905	1025	480	499	221	241	128	137	5728	6250

Table X.

Shewing the actual amount of Crime in each County, according to the average of the years 1845, 1846, 1847, *and* 1848; *and also the calculated amount supposing the ratio to be the same as that for the whole of England and Wales during the same years.—Males.*

Age.	Bedford.		Berks.		Bucks.		Cambridge.		Cheshire.		Cornwall.		Cumberland.	
	Number.		Number.		Number.		Number.		Number.		Number.		Number.	
	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.
Under 15 . .	3	6	4	12	4	10	4	6	11	39	10	14	4	5
15...20 . .	36	36	54	59	52	69	57	49	146	143	122	43	60	16
20...30 . .	54	62	87	104	77	120	95	89	238	258	163	86	90	36
30...40 . .	23	29	36	45	31	40	36	42	93	124	66	38	35	16
40...50 . .	12	19	18	23	17	20	19	17	44	59	36	24	19	10
50...60 . .	4	5	7	10	7	6	7	9	17	24	14	10	9	4
60 and upwards	2	2	5	3	4	4	4	5	9	10	8	7	5	3
Total . . .	134	159	211	256	192	289	222	217	558	657	419	222	222	90
Population . .	40646	...	63952	...	59158	...	65175	...	161416	...	127615	...	67202	...
Proportion;–1 in	303	256	303	250	308	205	293	300	289	246	304	575	303	747

	Derby.		Devon.		Dorset.		Durham.		Essex.		Gloucester.		Hereford.	
Under 15 . .	7	9	13	28	5	12	9	11	9	24	11	72	3	7
15...20 . .	94	42	176	127	56	41	122	37	113	136	138	227	36	31
20...30 . .	151	77	254	139	80	82	218	89	184	219	226	269	57	74
30...40 . .	62	39	102	115	34	40	76	39	72	78	94	109	25	30
40...50 . .	31	19	57	66	18	20	35	17	41	44	49	60	14	15
50...60 . .	12	9	26	30	8	9	13	7	16	19	19	29	6	9
60 and upwards	7	4	15	15	5	6	6	3	9	9	11	17	4	5
Total . . .	364	199	643	520	206	210	479	203	444	529	548	783	145	171
Population . .	109180	...	199188	...	64493	...	135334	...	135252	...	166127	...	45280	...
Proportion;–1 in	300	549	310	383	313	307	282	667	305	256	303	212	312	265

TABLE X.—MALES.—*(continued.)*

AGE.	HERTFORD.		HUNTS.		KENT.		LANCASTER.		LEICESTER.		LINCOLN.		MIDDLESEX.	
	Number.		Number.		Number.		Number.		Number.		Number.		Number.	
	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated	Actual.
Under 15 . .	4	10	1	4	14	36	44	139	6	17	9	14	34	296
15...20 . .	53	60	20	16	190	162	626	581	73	87	125	71	476	1100
20...30 . .	82	96	32	32	315	296	1106	943	109	109	204	158	1002	1285
30...40 . .	33	41	12	13	121	120	444	451	45	44	79	71	407	477
40...50 . .	17	24	7	6	58	62	193	199	25	21	42	33	200	257
50...60 . .	7	9	2	2	26	19	68	77	10	10	16	11	69	99
60 & upwards.	4	6	1	1	17	15	30	33	6	7	10	7	30	44
Total . . .	200	246	75	74	741	710	2511	2423	274	295	485	365	2218	3558
Population . .	60970	...	22585	...	223242	...	702911	...	83256	...	145103	...	629729	...
Proportion;–1 in	305	248	301	305	301	314	280	290	304	282	300	397	284	177

	MONMOUTH.		NORFOLK.		NORTHAMPTON.		NORTHUMBERLAND.		NOTTINGHAM.		OXFORD.		RUTLAND.	
Under 15 . .	4	7	11	33	5	11	6	10	7	16	4	9	1	1
15...20 , .	51	33	136	147	70	46	84	38	80	74	53	51	7	3
20...30 . .	112	85	192	224	108	105	146	54	126	108	85	95	10	15
30...40 . .	40	35	82	83	43	42	56	22	57	40	33	43	5	8
40...50 . .	18	22	48	60	23	18	27	9	29	19	18	24	2	2
50...60 . .	6	6	18	23	9	8	11	4	12	7	7	12	1	1
60 & upwards .	3	5	12	13	5	6	6	2	7	3	5	6	1	1
Total . . .	234	193	499	583	263	236	336	139	318	267	205	240	27	31
Population . .	64892	...	156326	...	78962	...	97483	...	98442	...	62794	...	8384	...
Proportion;–1 in	277	336	313	268	300	335	290	701	309	369	306	261	311	270

TABLE X.—MALES.—*(continued.)*

AGE.	SALOP.		SOMERSET.		SOUTHAMPTON.		STAFFORD.		SUFFOLK.		SURREY.	
	Number.		Number.		Number.		Number.		Number.		Number.	
	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.	Calculated.	Actual.
Under 15 . . .	6	12	11	43	9	39	14	41	8	19	15	64
15...20 . . .	83	41	149	171	121	128	190	164	104	84	181	232
20...30 . . .	128	83	218	242	203	221	333	303	151	169	342	334
30...40 . . .	49	34	87	92	73	84	126	118	62	59	145	130
40...50 . . .	27	25	49	51	39	43	58	56	34	37	71	65
50...60 . . .	11	11	20	28	18	22	22	23	14	16	26	29
60 & upwards .	7	8	12	12	10	13	11	14	9	9	13	10
Total . . .	311	214	546	639	473	550	754	719	382	393	793	864
Population . .	93540	...	166952	...	142197	...	215051	...	119516	...	234579	...
Proportion;—1 in	301	437	306	261	300	258	283	299	313	304	296	271

	SUSSEX.		WARWICK.		WESTMORELAND.		WILTS.		WORCESTER.		YORK.	
Under 15 . . .	8	32	10	51	2	1	7	17	6	27	42	66
15...20 . . .	96	87	136	229	2	7	91	92	75	115	585	306
20...30 . . .	152	152	243	304	29	19	132	146	124	200	947	560
30...40 . . .	65	64	97	117	11	8	52	59	52	70	359	261
40...50 . . .	34	36	48	50	6	5	29	38	27	34	178	108
50...60 . . .	14	13	17	19	3	2	11	17	10	15	104	41
60 & upwards .	8	11	9	8	2	1	8	9	6	10	37	21
Total . . .	377	395	560	778	55	43	330	378	300	471	2252	1363
Population . .	116932	...	163185	...	22215	...	100851	...	91301	...	644534	...
Proportion;—1 in	310	296	291	210	404	516	305	267	304	194	286	473

Table XI.

England and Wales.—Males.

Annual rate of increase for 1842–4 = 1·029533 = λ^{1} 0·0126075.

Counties.	1842–4.						1845–8.		
	Amount of Crime according to the average of England and Wales.				Actual Crime.	Difference per cent.	Amount of Crime according to the average of England and Wales.	Actual Crime.	Difference per cent.
	Total Crime.	λ.	Corrected λ and number.						
Bedford	147	2·1673173	2·1799248	151·30	184	+21·8	134	159	+18·6
Berks	230	2·3617278	2·3743353	236·77	257	+ 8·5	211	256	+21·3
Bucks	216	2·3344538	2·3470613	222·36	263	+18·5	192	289	+50·5
Cambridge	238	2·3765770	2·3891845	245·01	228	− 6·9	222	217	− 2·2
Cheshire	575	2·7596678	2·7712753	590·57	792	+34·2	558	657	+17·7
Cornwall	460	2·6627578	2·6753653	473·55	215	−54·5	419	222	−47·0
Cumberland	248	2·3944517	2·4070592	255·30	81	−68·2	222	90	−14·4
Derby	395	2·5965971	2·6092046	406·63	270	−33·6	364	199	−45·3
Devon	712	2·8524800	2·8650875	732·97	547	−25·4	643	520	−19·1
Dorset	228	2·3579348	2·3705423	234·72	183	−22·1	206	210	+ 1·9
Durham	478	2·6794279	2·6920354	492·08	248	−49·6	479	203	−57·6
Essex	491	2·6910815	2·7036890	505·46	589	+16·6	444	529	+19·1
Gloucester	593	2·7730547	2·7856622	610·47	932	+52·8	548	783	+42·9
Hereford	163	2·2121876	2·2247951	167·80	197	+17·3	145	171	+17·9
Herts	223	2·3483049	2·3609124	229·57	258	+12·2	200	246	+23·0
Hunts	85	1·9294189	1·9420264	87·50	58	−33·3	75	74	− 1·3
Kent	787	2·8959747	2·9085822	810·18	835	+ 3·1	741	710	− 4·2
Lancaster	2501	3·3981137	3·4107212	2574·67	2802	+ 8·8	2511	2423	− 3·5
Leicester	303	2·4814426	2·4940501	311·92	431	+38·1	274	295	+ 7·6
Lincoln	527	2·7218106	2·7344181	542·52	433	−20·1	485	365	−24·7
Middlesex	2326	3·3666097	3·3792172	2394·51	3056	+27·7	2218	3558	+60·4
Monmouth	225	2·3521825	2·3647900	231·62	201	−13·3	234	193	−17·5
Norfolk	559	2·7474118	2·7600193	575·46	661	+14·9	499	583	+16·8
Northampton	287	2·4578819	2·4704894	295·45	261	−11·5	263	236	−10·3
Northumberland	361	2·5575072	2·5701147	371·63	197	−47·0	336	139	−58·6
Notts	346	2·5390761	2·5516836	356·19	307	−13·8	318	267	−16·0
Oxford	230	2·3617278	2·3743353	236·77	265	+11·8	205	240	+17·1
Rutland	30	1·4771213	1·4897288	30·88	31	+ ·4	27	31	+14·8
Salop	348	2·5415792	2·5541867	358·25	399	+11·4	311	214	−31·2
Somerset	639	2·8055009	2·8181084	659·34	843	+27·9	546	639	+17·0
Southampton	507	2·7050080	2·7176155	521·93	510	− 2·3	473	550	+16·3
Stafford	768	2·8853612	2·8979687	790·62	962	+21·6	754	719	− 4·7
Suffolk	430	2·6331685	2·6460760	442·67	492	+11·1	382	393	+ 2·9
Surrey	820	2·9138139	2·9264214	844·16	728	−13·7	793	864	+ 8·9
Sussex	410	2·6127839	2·6253914	422·08	405	− 4·0	377	395	+ 4·8
Warwick	580	2·7634280	2·7760355	597·08	825	+38·2	560	778	+38·9
Westmoreland	82	1·9138139	1·9264214	84·41	27	−67·8	55	43	−21·8
Wilts	366	2·5634811	2·5760886	376·78	417	+10·7	330	378	+14·5
Worcester	328	2·5158738	2·5284813	337·66	516	+52·7	300	471	+57·0
York	2329	3·3671695	3·3797770	2397·60	1818	−24·2	2252	1363	−39·5

The first column of each group shews the amount of crime at each period of life, assuming the intensity to be the same as over the whole country, and also that the population of each group was the same as at the period of the census in 1841. Under the total of these results will be found the corrected total, making allowance for the increase of population during the years 1842, 1843, and 1844. These corrections were taken from Table XI, and in the early part of this paper the formula for the correction is given. In the next column of each group will be found the actual number of criminals at the same ages, and in the third column is set forth the difference per cent. between the calculated and actual amount of crime. The results of this column are of the utmost importance, as they shew not only whether the total amount of crime in a given district is above or below the average for the whole kingdom, but they also point out what are the periods of life at which the most marked and important differences exist, thus leading the way to more definite and accurate views on criminal jurisprudence.

If the whole group of the Great Northern and Midland mining and manufacturing districts be taken, it will be seen that there is exactly 2·3 per cent. less crime than would be according to the average for all England and Wales, while in the agricultural counties there is an excess of 5·9 per cent. Again, if the various groups of the manufacturing and mining districts be examined, it will be found that in the northern mining district, which includes Cumberland, Northumberland, and Durham, crime is 52·1 per cent. below the average; and in the cotton and woollen manufacturing district, which includes Lancashire and Yorkshire, crime is 7·0 per cent. under the average of the whole country; but, on the other hand, in the two remaining districts, the one composing the cotton, woollen, silk, and lace-fabric district, including Chester, Derby, Nottingham, and Leicester—and the other composing the hardware, pottery, and glass manufacturing district, including Staffordshire, Warwick, and Worcester—there is an increase of crime, the former being 8·5 per cent. and the latter 33·5 per cent. above the average for the whole kingdom. Contrasting the various sections of the agricultural group with them, they will be seen to present a remarkable uniformity; the excess of crime in the first division being 5·3 per cent., in the second 5·7 per cent., and in the third 6·8 per cent., while the excess for the whole of the agricultural districts combined has been shewn to be 5·9 per cent.

It is, therefore, evident that there is something in the mining and manufacturing condition of the people, having a powerful influence in stimulating the amount of crime, as in one portion there is an excess of 33·5 per cent., while in another, crime is 52·1 per cent. below the average; and although the whole combined shews a less degree of crime than the average of the whole agricultural districts, and also less than the average of all England and Wales, still the remarkable disparity existing between particular manufacturing groups bears evidence that there must be some peculiar element operating in the social and moral state of the people, which it is highly important to understand.

[Before,

Table XII.—Males.

Difference between the Actual Amount of Crime in each District and the Average for England and Wales.

Age.	Great Northern and Midland Mining and Manufacturing Districts.														
	Northern Mining District.			Cotton and Woollen Manufacture.			Cotton, Woollen, Silk, and Lace Fabrics.			Hardware, Pottery, and Glass Manufacture.			Total.		
	Cumberland, Northumberland, and Durham.			Lancashire and Yorkshire.			Chester, Derby, Nottingham, and Leicester.			Staffordshire, Warwick, and Worcester.					
	Calculated.	Actual.	Difference per Cent.	Calculated.	Actual.	Difference per Cent.	Calculated.	Actual.	Difference per Cent.	Calculated.	Actual.	Difference per Cent.	Calculated.	Actual.	Difference per Cent.
Under 15	68	38	— 29·4	297	271	— 8·7	103	113	+ 9·7	105	140	+ 33·3	573	562	— 1·9
15 ... 20	257	111	— 56·8	1147	1008	— 12·1	388	374	— 3·6	385	518	+ 34·5	2177	2011	— 7·6
20 ... 25	272	126	— 53·6	1194	1157	— 3·1	384	446	— 1·6	410	590	+ 43·0	2260	2319	+ 2·6
25 ... 30	174	87	— 50·0	787	785	— ·2	254	279	+ 9·8	277	363	+ 31·0	1492	1514	+ 1·4
30 ... 40	175	88	— 49·7	803	819	+ 1·9	267	321	— 20·2	279	397	+ 42·3	1524	1625	+ 6·6
40 ... 50	83	47	— 43·3	370	376	+ 1·6	132	155	+ 17·4	134	180	+ 34·3	719	758	+ 5·4
50 ... 60	38	19	— 50·0	159	142	— 10·6	60	76	+ 26·6	57	79	+ 38·5	314	316	+ ·6
60 & upwards	20	10	— 50·0	73	62	— 15·0	31	42	+ 35·5	29	36	+ 24·1	153	150	— 1·9
Total . . .	1087	526	— 51·6	4830	4620	— 4·3	1619	1806	+ 11·5	1676	2303	+ 37·4	9212	9255	+ ·4
Corrected Total	1119	...	— 52·1	4972	...	— 7·0	1665	...	+ 8·5	1725	...	+ 33·5	9481	...	— 2·3
Population .	366492			1598486			554607			566617			3086202		
Proportion;—1 in	327–337			321–346			333–342			328–338			325–333		

TABLE XII.—MALES.—(*continued.*)

Age.	Agricultural Counties.											
	North Eastern and Eastern.			Midland.			Southern and South Western.			Total.		
	Lincoln, Norfolk, Suffolk, and Essex.			Cambridge, Northampton, Herts, Beds, Bucks, Oxford, and Berks.			Sussex, Hants, Wilts, Dorset, and Somerset.					
	Calculated.	Actual.	Difference per Cent.	Calculated.	Actual.	Difference per Cent.	Calculated.	Actual.	Difference per Cent.	Calculated.	Actual.	Difference per Cent.
Under 15	131	121	— 7·6	102	78	— 23·5	139	127	— 8·6	372	326	— 12·3
15 to 20	483	512	+ 6·0	378	348	— 7·9	510	555	+ 8·8	1371	1415	+ 3·2
20 ... 25	475	585	+ 23·1	380	464	+ 22·1	538	614	+ 14·1	1393	1663	+ 19·3
25 ... 30	302	326	+ 7·9	238	271	+ 13·8	318	347	+ 9·1	858	944	+ 10·0
30 ... 40	319	347	+ 8·7	251	303	+ 20·7	335	375	+ 11·9	905	1025	+ 13·3
40 ... 50	173	164	— 5·2	130	147	+ 13·0	177	188	+ 6·2	480	499	+ 3·5
50 ... 60	78	76	— 2·5	59	66	+ 11·8	84	99	+ 17·8	221	241	+ 9·1
60 and upwards	46	44	— 4·3	33	33	...	49	60	+ 24·5	128	137	+ 7·0
Total	2007	2175	+ 8·3	1571	1710	+ 8·8	2150	2365	+ 10·0	5728	6250	+ 9·1
Corrected Total .	2066	...	+ 5·3	1617	...	+ 5·7	2215	...	+ 6·8	5898	...	+ 5·9
Population . .	704380			545243			740727			1990350		
Proportion;—1 in	340–324			337–318			334–313			337–318		

Before, however, entering further into that part of the subject, it may be better to refer to another feature of importance in Table XII, for the first time exhibiting anything like a clear view of the question.

It has been usual of late to refer to juvenile delinquency as an explanation of the increase of crime in many districts; in fact, so powerfully has this been felt in some quarters, that the most strenuous efforts have been made, with a view of reducing the cases on the criminal calendar; and yet it will be seen that the facts of the case do not support the supposition, that either the increase or decrease of crime in particular districts is materially, if at all, affected by fluctuations in juvenile crime. This will appear most evident by an inspection of any one of the nine groups, or combinations, given in Table XII. If the general result for any one, or all of them, whether in connection with an increase or decrease of crime, be compared with the corresponding features at the juvenile ages, there will not be found a single instance, in which the character of the general result is so strongly confirmed by the facts at the younger ages, as by those at the more advanced periods of life. Should any change or movement be found in the criminal returns of any particular district, that change will be discovered to be promoted, not so much by fluctuations at the terms of life 10–15 or 15–20, as by the increase or decrease among those persons of more advanced ages. The general total for the mining and manufacturing districts shews a difference of + ·4 per cent., but at the juvenile ages under 15 and 15–20, the differences are − 1·9 per cent. and − 7·6 per cent. respectively, so that while the gross results are positive, those at the younger ages are negative. Again, the general total for the agricultural districts is + 9·1 per cent., but the result for under 15 is − 12·3 per cent., and for 15–20 only + 3·2 per cent. Relations precisely similar will be found in each of the other groups, thus leading to the conclusion that, in the juvenile period of life, the tendency to crime is within the influence of more constant laws or elements, and therefore shews less fluctuation than in mature life, when the conduct and disposition of individuals come more under the control of external circumstances.

In such groups of counties and districts as those given in Table XII, it is evidently of the first importance, that the manufacturing or agricultural character of the districts should, in reality, be a decided and prevailing feature, otherwise their supposed relation and influence on crime can never be determined. There are no counties or great districts of the kingdom, in which either agriculture or manufactures prevail to the entire exclusion of other interests; but still there are many districts in which either agriculture or manufactures form so decided a feature, that if the moral and social conditions thence arising have any influence on the amount of crime, the evidence of that supposed influence must be observable. In England and Wales, at the period of the last census, the average ratio of agriculturists to the whole population was 7·9 per cent.; and the first group of the following Table XIV contains the results for the ten counties in which there was found to be the least proportion of agriculturists; and the second group of the same Table contains the results for the eleven counties in which the highest ratio of agricul-

turists was found. It will be seen that the ratio of agriculturists for each county is set forth in the second column; in the third is given the average annual ratio of crime for the whole kingdom; and in the fourth, the actual crime in the given county. These results are taken from Table XI; and a comparison of the total of the two last columns will shew whether the crime in each group or section is above or below the average for the whole kingdom. If, then, the greater or less proportion of agriculturists in a community has any material influence on the degree of crime, it might reasonably be looked for in the results of those two sections; but it will be found that in the group of least agriculturists there is an excess of 6·0 per cent. of crime above the average of England and Wales, and by excluding the county of Lancaster, which is of sufficient magnitude to form a group of itself, the excess will still be 4·6 per cent. Compare this with the results for the section containing the highest average of agriculturists, and the excess of crime will in that also be found to be exactly 4·6 per cent; and so far, therefore, as a maximum or a minimum ratio of agriculturists in a community is concerned, there seems to be little or no difference in the amount of crime. On reflection, it will appear that a high ratio of agriculturists in any district does not necessarily imply a low ratio of manufacturers, and *vice versâ*, as both interests may co-exist in maximum or minimum in any district; another combination was therefore adopted, in order to determine the influence of manufactures.

In England and Wales the average ratio of manufacturers to the whole population is 16·5 per cent.; and in the third group of Table XIV will be found the results for the eight counties in which there is the highest ratio of manufacturers. It thence appears that the actual crime exceeds the average of the whole country by 18·2 per cent., and, exclusive of Lancashire and Middlesex, by 17·7 per cent.; but in the fourth group of the same Table, which is composed of the counties having the least average of manufacturers, the actual crime is under the average by 2·9 per cent.

It is evident that the preceding combinations are liable to the objection, that the influence of the high or low ratio of agriculturists may be neutralised by a corresponding high or low ratio of manufacturers; and hence the preceding curious results. To meet this objection, Groups Fifth and Sixth have been formed.

It has already been stated, that the ratio of agriculturists to manufacturers in England and Wales is 7·9 per cent. to 16·5 per cent.; difference, 8·6 per cent. In order to obtain a group of counties in which the manufacturing interests formed a proper and decidedly prevailing feature, Group 5 has been formed of those counties only in which the manufacturing interest exceeds the agricultural interest by at least 33·33 per cent. more than the above difference for the whole kingdom; and the result arrived at is, that the actual crime exceeds the average of the country by 15·0 per cent.; and excluding the counties of Lancaster and Middlesex, the excess is 10·8 per cent. Again, in the sixth group of Table XIV the results of those counties are given, in which the agriculturists are above the average ratio by at least 50 per cent.; and therefore those two last groups [must exhibit

Table XIII.—Males.

Difference between the Actual Amount of Crime in each District and the Average for England and Wales.

Age.	Great Northern and Midland Mining and Manufacturing Districts.														
	Northern Mining District.			Cotton and Woollen Manufacture.			Cotton, Woollen, Silk, and Lace Fabrics.			Hardware, Pottery and Glass Manufacture.			Total.		
	Cumberland, Northumberland, and Durham.			Lancashire and Yorkshire.			Chester, Derby, Nottingham, and Leicester.			Staffordshire, Warwick, and Worcester.					
	Calculated.	Actual.	Difference per Cent.	Calculated.	Actual.	Difference per Cent.	Calculated.	Actual.	Difference per Cent.	Calculated.	Actual.	Difference per Cent.	Calculated.	Actual.	Difference per Cent.
Under 15	19	26	+ 36·8	86	205	+ 138·4	31	81	+ 161·3	30	119	+ 296·7	166	431	+ 159·6
15 ... 20	266	91	— 65·8	1211	887	— 26·7	393	346	— 11·9	401	508	+ 26·7	2271	1832	— 19·3
20 ... 30	454	179	— 60·6	2053	1503	— 21·4	624	552	— 11·5	700	807	+ 15·3	3831	3041	— 52·2
30 ... 40	167	77	— 53·9	803	712	— 11·3	257	247	— 3·9	275	305	+ 10·9	1502	1341	— 10·7
40 ... 50	81	36	— 55·6	371	307	— 17·2	129	118	— 8·5	133	140	+ 5·3	714	601	— 15·8
50 ... 60	33	15	— 54·5	172	118	— 31·4	51	50	— 2·0	49	57	+ 16·3	305	240	— 21·3
60 & upwards	17	8	— 52·9	67	54	— 19·4	29	24	— 17·2	26	32	+ 23·1	139	118	— 15·1
Total . . .	1037	432	— 58·5	4763	3786	— 20·5	1514	1418	— 6·3	1614	1968	+ 21·9	8928	7604	— 14·8
Population . .	300019			1347445			452294			469537			2569295		
Proportion;—1 in	289–692			283–356			299–319			291–239			288–338		

Table XIII.—Males.—(*continued.*)

Age.	Agricultural Counties.											
	North Eastern and Eastern.			Midland.			Southern and South Western.			Total.		
	Lincoln, Norfolk, Suffolk, and Essex.			Cambridge, Northampton, Herts, Beds, Bucks, Oxford, and Berks.			Sussex, Hants, Wilts, Dorset, and Somerset.					
	Calculated.	Actual.	Difference per Cent.	Calculated.	Actual.	Difference per Cent.	Calculated.	Actual.	Difference per Cent.	Calculated.	Actual.	Difference per Cent.
Under 15	37	90	+ 143·2	28	64	+ 128·6	40	143	+ 257·5	105	297	+ 182·9
15 to 20	478	438	— 8·4	375	370	— 1·3	513	519	+ 1·2	1366	1327	— 2·8
20 ... 30	731	770	+ 5·3	588	671	+ 14·1	785	843	+ 7·4	2104	2284	+ 8·5
30 ... 40	295	291	— 1·4	235	282	+ 20·0	311	339	+ 9·0	841	912	+ 8·4
40 ... 50	165	174	+ 5·5	124	145	+ 16·9	169	188	+ 11·2	458	507	+ 10·7
50 ... 60	64	69	+ 7·8	48	59	+ 22·9	71	89	+ 25·3	183	217	+ 18·6
60 and upwards	40	38	— 5·0	29	32	+ 10·3	43	51	+ 18·6	112	121	+ 7·1
Total	1810	1870	+ 3·3	1427	1623	+ 13·7	1932	2172	+ 12·4	5169	5665	+ 9·6
Population . .	556197			431657			591425			1579279		
Proportion;—1 in	307–297			302–265			306–272			305–279		

must exhibit the most striking contrast between each other in respect to their manufacturing and agricultural populations. If then the predominance of either the one or the other interest has any influence on the amount of crime, it should manifest itself in the results of these two groups; but it will appear that the actual crime in the last of these groups also exceeds the average of the whole kingdom; the excess being 4·2 per cent.; and although this difference falls somewhat short of the other, it is not of so marked a nature as to demand further investigation.

Carrying out the same mode of classification, Group 7 has been formed of the seven counties in England and Wales, in which the manufacturing and agricultural interests were as nearly as possible equal, in no instance differing by more than ·6 per cent.; and it is somewhat remarkable to find that in this case the excess of crime is 4·5 per cent., differing from the result in the preceding group by only ·3 per cent. It is therefore evident that the mere fact of the difference in the habits and condition of agriculturists and manufacturers can have very little to do with the increase or decrease of crime, and that some other solution of the very great disparity found to prevail between particular districts must be sought for. The following Abstract shews the difference per cent. between the actual amount of crime in each of the districts or groups of Table XIV, and the average for the whole of England and Wales:—

MALES.

GROUP.	Average Crime.		Actual Crime.		Difference per Cent.	
	1842—4.	1845—8.	1842—4.	1845—8.	1842—4.	1845—8.
1. Lowest Ratio of Agriculturists	4934·86	4626	5163	4535	+ 4·6	— 2·0
2. Highest Ratio of Ditto	3009·05	3045	3150	3338	+ 4·6	+ 9·6
3. Highest Ratio of Manufacturers	3053·01	2828	3593	3915	+ 17·7	+ 38·4
4. Lowest Ratio of Ditto	2001·25	1772	1941	1782	— 2·9	+ ·6
5. Manufacturers, 33⅓ per cent. above the average	3897·17	3621	4321	3779	+ 10·8	+ 4·4
6. Agriculturists, 50 per cent. above the average	3411·13	3024	3555	3257	+ 4·2	+ 7·7
7. Agriculturists and Manufacturers nearly equal	2348·68	2086	2456	2198	+ 4·5	+ 5·4
8. Greatest Wealth	2527·31	2261	2303	2300	— 8·8	+ 1·7
9. Least Wealth	2541·67	2334	2512	2136	— 1·1	— 8·5

The preceding combinations so far as relates to the period 1842–4 have shewn that in the least as well as in the most agricultural districts the excess of crime was precisely equal, namely, 4·6 per cent. It was likewise seen that in the districts in which there is the highest average of manufacturers, as well as that in which there is the highest average of agriculturists, and also that in which the two interests are equal, the tendency to crime differs very little. It may therefore be safely concluded that neither of them gives any clue to work out the problem—What is the element or feature in the condition of life and social state of society which produces in one great community an excess of crime amounting to 52·1 per cent. above the average, and in another community reduces crime below the average 33·5 per cent.?

Another argument usually adduced in explanation of the greater or less prevalence [of crime,

Table XIV.

1842–4.

Difference between the Actual Amount of Crime in each District, and the Average for England and Wales.—Males.

Group 1.

In England and Wales the average ratio of Agriculturists to the whole Population is 7·9 per cent. In the following there is the lowest average of Agriculturists.

Counties.	Ratio of Agriculturists.	Calculated Average.	Actual Crime.
Lancaster	3·0	2574·67	2802
Durham	4·4	492·08	248
Surrey	4·4	844·16	728
Stafford	5·7	790·62	962
Warwick	6·0	597·08	825
Monmouth	6·5	231·62	201
Chester	6·7	590·57	792
Northumberland	6·9	371·63	197
Derby	7·1	406·63	276
Gloucester	7·2	610·47	932
		7509·53	7965
Lancaster	...	2574·67	2802
		4934·86	5163

Group 2.

Highest average of Agriculturists.

Counties.	Ratio of Agriculturists.	Calculated Average.	Actual Crime.
Lincoln	15·9	542·52	433
Rutland	15·6	30·88	31
Essex	14·8	505·46	589
Hereford	14·6	167·80	197
Hants	14·5	87·50	58
Wilts	14·1	376·78	424
Bucks	14·0	151·30	184
Bedford	13·8	222·36	263
Berks	13·2	236·77	251
Cambridge	13·9	245·01	228
Suffolk	13·9	424·67	492
		3009·05	3150

Group 3.

In England and Wales the average ratio of Manufacturers to the whole Population is 16·5 per cent. In the following Counties there is the highest average of Manufacturers.

Counties.	Ratio of Manufacturers.	Calculated Average.	Actual Crime.
Lancaster	28·1	2574·67	2802
Chester	23·5	590·57	792
Warwick	21·9	597·08	825
Notts	20·6	356·19	307
Middlesex	20·0	2394·51	3076
Leicester	19·2	311·92	431
Derby	18·9	406·63	276
Stafford	18·7	790·62	962
		8022·19	9471
Lancaster and Middlesex	...	4969·18	5878
		3053·01	3593

TABLE XIV.—MALES.—(*continued.*)

GROUP 4.

Lowest average of Manufacturers.

COUNTIES.	Ratio of Manufacturers.	Calculated Average.	Actual Crime.
Cambridge	8·9	245·01	228
Huntingdon	9·2	87·50	58
Rutland	9·2	30·88	31
Essex	9·3	505·46	589
Lincoln	9·6	542·52	433
Sussex	9·7	422 08	405
Hereford	9·8	167·80	197
		2001·25	1941

GROUP 5.

The average ratio of Agriculturists to Manufacturers in England and Wales is 7·9 to 16·5 ; difference = 8·6.
In the following Counties the Manufacturers are above the average difference by 33⅓ per cent.

COUNTIES.	Agricultural Ratio.	Manufacturing Ratio.	Difference.	Calculated Average.	Actual Crime.
Chester	6·7	23·5	16·9	590·57	792
Derby	7·1	18·9	11·8	406·63	276
Lancaster	3·0	28·1	25·1	2574·67	2802
Middlesex	1·1	20·0	18·9	2394·51	3076
Warwick	6·0	21·9	15·9	597·08	825
Stafford	5·7	18·7	13·0	790·62	962
Notts	8·2	20·6	12·4	356·19	307
Surrey	4·4	16·2	11·8	844·16	728
Leicester	7·9	19·2	11·3	311·92	431
				8866·35	10199
Lancaster and Middlesex	...	...	...	4969·18	5878
				3897·17	4321

GROUP 6.

In the following Counties the Agriculturists are above the average ratio by at least double the whole average difference.

COUNTIES.	Agricultural Ratio.	Manufacturing Ratio.	Difference.	Calculated Average.	Actual Crime.
Bucks	14·0	12·6	1·4	222·36	263
Bedford	13·8	10·7	3·1	151·30	184
Sussex	11·9	9·7	2·2	422·08	405
Berks	13·2	10·2	3·0	236·77	251
Wilts	14·1	10·8	3·3	376·78	424
Suffolk	13·9	10·0	3·9	422·67	492
Hereford	14·6	9·9	4·7	167·80	197
Cambridge	13·9	8 9	5·0	245·01	228
Hunts	14·5	9·2	5·3	87·50	58
Essex	14 8	9·3	5·5	505·46	589
Lincoln	15·9	9·6	6·3	542·52	433
Rutland	15·6	9·2	6·4	30·88	31
				3411·13	3555

Table XIV.—Males.—*(continued.)*

Group 7.

Counties in which the Agricultural and Manufacturing interests are nearly equal.

Counties.	Agricultural Ratio.	Manufacturing Ratio.	Difference.	Calculated Average.	Actual Crime.
Bedford	13·8	13·3	+0·5	151·30	184
Dorset	10·9	11·1	−0·3	234·72	183
Hertford	12·8	12·8	0·0	229·57	258
Norfolk	12·2	11·8	+0·4	557·46	661
Northampton	12·9	13·5	−0·6	295·45	261
Salop	11·7	11·9	−0·2	358·25	399
Southampton	10·0	10·6	−0·6	521·93	510
				2348·68	2456

Group 8.

In England and Wales the average proportion of persons of independent means = 2·8 per cent. In the following Counties the proportion is at least 33 per cent. above the average.

Counties.	Ratio.	Calculated Average.	Actual Crime.
Surrey	4·2	844·16	728
Westmoreland	4·0	84·41	27
Devon	3·8	732·97	535
Cumberland	3·7	255·30	81
Gloucester	3·7	610·47	932
		2527·31	2303

Group 9.

Counties in which the proportion is 33 per cent. less than the average.

Counties.	Ratio.	Calculated Average.	Actual Crime.
Bedford	1·6	151·30	184
Stafford	1·6	790·62	962
Derby	1·9	406·63	276
Monmouth	1·9	231·62	201
Northampton	1·9	295·45	261
Nottingham	1·9	356·19	307
Bucks	2·0	222·36	263
Hunts	2·0	87·50	58
		2541·67	2512

Table XV.

1845–8.

Difference between the Actual Amount of Crime in each District, and the Average for England and Wales.—Males.

Group 1.

In England and Wales the average ratio of Agriculturists to the whole Population is 7·9 per cent. In the following there is the lowest average of Agriculturists.

Counties.	Ratio of Agriculturists.	Calculated Average.	Actual Crime.
Lancaster	3·0	2511	2423
Durham	4·4	479	203
Surrey	4·4	793	864
Stafford	5·7	754	719
Warwick	6·0	560	778
Monmouth	6·5	234	193
Chester	6·7	558	657
Northumberland	6·9	336	139
Derby	7·1	364	199
Gloucester	7·2	548	783
		7137	6958
Lancaster	...	2511	2423
		4626	4535

Group 2.

Highest average of Agriculturists.

Counties.	Ratio of Agriculturists.	Calculated Average.	Actual Crime.
Lincoln	15·9	485	365
Rutland	15·6	27	31
Essex	14·8	444	529
Hereford	14·6	145	171
Hants	14·5	473	550
Wilts	14·1	330	378
Bucks	14·0	192	289
Bedford	13·8	134	159
Berks	13·2	211	256
Cambridge	13·9	222	217
Suffolk	13·9	382	393
		3045	3338

Group 3.

In England and Wales the average ratio of Manufacturers to the whole Population is 16·5 per cent. In the following Counties there is the highest average of Manufacturers.

Counties.	Ratio of Manufacturers.	Calculated Average.	Actual Crime.
Lancaster	28·1	2511	2423
Chester	23·5	558	657
Warwick	21·9	560	778
Nottingham	20·6	318	267
Middlesex	20·0	2218	3558
Leicester	19·2	274	295
Derby	18·9	364	199
Stafford	18·7	754	719
		7557	8896
Lancaster and Middlesex	...	4729	4981
		2828	3915

TABLE XV.—MALES.—(*continued.*)

GROUP 4.

Lowest average of Manufacturers.

COUNTIES.	Ratio of Manufacturers.	Calculated Average.	Actual Crime.
Cambridge	8·9	222	217
Huntingdon	9·2	75	74
Rutland	9·2	27	31
Essex	9·3	444	529
Lincoln	9·6	485	365
Sussex	9·7	374	395
Hereford	9·8	145	171
		1772	1782

GROUP 5.

The average ratio of Agriculturists to Manufacturers in England and Wales is 7·9 to 16·5; diff. = 8·6. In the following Counties the Manufacturers are above the average difference by 33⅓ per cent.

COUNTIES.	Agricultural Ratio.	Manufacturing Ratio.	Difference.	Calculated Average.	Actual Crime.
Chester	6·7	23·5	16·9	558	657
Derby	7·1	18·9	11·8	364	199
Lancaster	3·0	28·1	25·1	2511	2423
Middlesex	1·1	20·0	18·9	2218	3558
Warwick	6·0	21·9	15·9	560	778
Stafford	5·7	18·7	13·0	754	719
Nottingham	8·2	20·6	12·4	318	267
Surrey	4·4	16·2	11·8	793	864
Leicester	7·9	19·2	11·3	274	295
				8350	9760
Lancaster & Middlesex	...	...	...	4729	5981
				3621	3779

GROUP 6.

In the following Counties the Agriculturists are above the average ratio by at least double the whole average difference.

COUNTIES.	Agricultural Ratio.	Manufacturing Ratio.	Difference.	Calculated Average.	Actual Crime.
Bucks	14·0	12·6	1·4	192	289
Bedford	13·8	10·7	3·1	134	159
Sussex	11·9	9·7	2·2	377	395
Berks	13·2	10·2	3·0	211	256
Wilts	14·1	10·8	3·3	330	378
Suffolk	13·9	10·0	3·9	382	393
Hereford	14·6	9·9	4·7	145	171
Cambridge	13·9	8·9	5·0	222	217
Hunts	14·5	9·2	5·3	75	74
Essex	14·8	9·3	5·5	444	529
Lincoln	15·9	9·6	6·3	485	365
Rutland	15·6	9·2	6·4	27	31
				3024	3257

TABLE XV.—MALES.—(*continued.*)

GROUP 7.

Counties in which the Agricultural and Manufacturing interests are nearly equal.

COUNTIES.	Agricultural Ratio.	Manufacturing Ratio.	Difference.	Calculated Average.	Actual Crime.
Bedford	13·8	13·3	+ 0·5	134	159
Dorset	10·9	11·1	— 0·3	206	210
Hertford	12·8	12·8	0·0	200	246
Norfolk	12·2	11·8	+ 0·4	499	583
Northampton	12·9	13·5	— 0·6	263	236
Salop	11·7	11·9	— 0·2	311	214
Southampton	10·0	10·6	— 0·6	473	550
				2086	2198

GROUP 8.

In England and Wales the average proportion of persons of independent means is = 2·8 per cent. In the following Counties the proportion is at least 33 per cent. above the average.

COUNTIES.	Ratio.	Calculated Average.	Actual Crime.
Surrey	4·2	793	864
Westmoreland	4·0	55	43
Devon	3·8	643	520
Cumberland	3·7	222	90
Gloucester	3·7	548	783
		2261	2300

GROUP 9.

Counties in which the proportion is 33 per cent. less than the average.

COUNTIES.	Ratio.	Calculated Average.	Actual Crime.
Bedford	1·6	134	159
Stafford	1·6	754	719
Derby	1·9	364	199
Monmouth	1·9	234	193
Northampton	1·9	263	236
Nottingham	1·9	318	267
Bucks	2·0	192	289
Hunts	2·0	75	74
		2334	2136

of crime, is the comparative wealth or poverty of particular districts. No very exact means exist by which to determine in what districts or counties there is the highest or least proportion of wealth; but so far as means are available, an attempt has been made to test the value of the argument advanced.

In England and Wales, according to the census returns, the average ratio of persons of independent means is 2·8 per cent.; and by taking those counties as given in Group 8, in which the proportion is exceeded by at least 33 per cent., it will be found that the actual crime is below the average of the whole kingdom by 8·8 per cent.; but in connection with this, it is curious to observe the results of Group 9, which is made up of those counties in which the proportion of persons of independent means is 33 per cent. below the general average, for in that case also crime is below the average of the whole country, although to the extent of 1·1 per cent. only. No powerful or active element can therefore be traced in connection with this feature, sufficient to account for some of the widely different results already observed.

The preceding remarks have been made in respect to the results appearing in the sixth column of the Abstract given in page 346, and derived from Table XIV, but if attention be directed to column seven of the same Abstract, derived from Table XV, representing the results for the period 1845–8, it will be found that the same reasoning, with very slight modifications, will apply to nearly all the combinations.

In this country no satisfactory test can at this time be employed in order to discover those districts in which the people generally receive a greater or less degree of instruction. The Educational Returns, made in connection with the Census of 1851, as they relate to the younger portion of the population only, are not applicable: and perhaps the very best available test is that furnished by the returns of the Registrar-General. Under the New Marriage Act, every person married must sign the Marriage Register; and an abstract has been made for each county, shewing the number of persons signing the Register with their names, and the number signing with their marks; so that if the mere mechanical qualification of an individual being able to sign his name be regarded as evidence of the relative degree of education which he has received, it becomes possible to classify the several counties in England and Wales according to the degree of the education of its population. This test is of the more value because at that period of life at which the greatest amount of crime takes place, there is also the greatest number of marriages; and, consequently, both classes of facts will have a more immediate and direct relation to each other.

If the term education were held to signify the culture and elevation of the moral character, it is evident that its immediate and essential influence would be to destroy crime: in fact in this sense, education and freedom from crime must bear the relation to each other of cause and effect; and therefore when education is at a maximum, crime must of necessity be at a minimum; so that if the term be thus explained, statistical evidence would be *à priori* unnecessary to solve the problem proposed: but if the term education be used in its ordinary

acceptation, merely to imply instruction, it then becomes a fit and important question, whether education in this limited sense has any influence on the development of crime.

The proportion of the male population in England and Wales signing their marriage certificates with marks is 33 per cent. The first group in the following Table XVI is made up of those counties in which the proportion signing with marks exceeded the general average by at least 33·33 per cent., and may be called the counties of lowest degree of education. The second group in the same Table is composed of those counties in which the proportion is at least 25 per cent. under the average, and may be termed the group of highest degree of education. On comparing the results of these two groups, it is found that, during the period 1842–4, where there is the lowest degree of education, there is an excess of crime of 13·2 per cent.; but in the group of the highest degree of education the actual crime is 30·7 per cent. under the average of the whole kingdom, and during the years 1845–8, the corresponding results derived from Table XVII are an excess of crime of 14·6 per cent. in the group of lowest degree of education, but in the group of highest education crime is 21·0 per cent. below the average ratio for the kingdom. To this extent the influence of education is evident.

Table XVI.

1842–4.

In England and Wales 33 per cent. (Males) signed the Marriage Register by their *Marks*. In the following Counties the highest proportion did so, being all at least 33⅓ per cent. above the average.

Group 1.

Counties.	Ratio signing with their Marks.	Calculated Average.	Actual Crime.
Hertford	50	229·57	258
Monmouth	51	231·62	201
Bedford	49	151·30	184
Cambridge	47	245·01	228
Suffolk	47	442·67	492
Essex	47	505·46	589
Worcester	46	337·66	516
Hunts	44	87·50	58
		2230·79	2526

Group 2.

Counties in which the lowest proportion signed with their *Marks*, being all at least 25 per cent. below the average.

Counties.	Ratio signing with their Marks.	Calculated Average.	Actual Crime.
Bucks	14	222·36	263
Cumberland	16	255·30	81
Surrey	17	844·16	728
Northumberland	18	371·63	197
Westmoreland	20	84·41	27
Devon	28	732·97	535
Durham	26	492·08	248
		3002·91	2079

Table XVII.

1845–8.

Group 1.

In England and Wales 33 per cent. (Males) signed the Marriage Register by their *Marks*. In the following Counties the highest proportion did so, being all at least 33⅓ per cent. above the average.

Counties.	Ratio signing with their Marks.	Calculated Average.	Actual Crime.
Hertford	50	200	246
Monmouth	51	234	193
Bedford	49	134	159
Cambridge	47	222	217
Suffolk	47	382	393
Essex	47	444	529
Worcester	46	300	471
Hunts	44	75	74
		1991	2282

Group 2.

Counties in which the lowest proportion signed with their *Marks*, being all at least 25 per cent. below the average.

Counties.	Ratio signing with their Marks.	Calculated Average.	Actual Crime.
Bucks	14	192	289
Cumberland	16	222	90
Surrey	17	793	864
Northumberland	18	336	139
Westmoreland	20	55	43
Devon	28	643	520
Durham	26	479	203
		2720	2148

But it may be held, that in the two groups now referred to, the difference in the amount of crime may be owing to the influence of some other element than simply education. So far as the subject is yet interrogated, it may be fairly said, that a high state of education is always found accompanied with a reduced rate of crime, and that a low state of education carries with it an increased amount of crime; but it still remains to be determined whether that difference may not arise through the agency of some other element. It may be argued that a high state of education is generally the concomitant of wealth, or a more advanced position in the social scale of society, and hence the reduced rate of crime; and that a low state of education is usually associated with a peculiar grade of employments and manufactures, subject to marked fluctuations in prosperity, exposing those engaged in them to deprivation, temptation, and vice, and thus directly increasing the amount of crime: a result which is falsely believed to have arisen from

want of education, instead of the poverty and distress co-existing with it. To try the strength of this objection, a still further analysis of the facts presented will be necessary.

If it were possible to arrange the several counties or districts in sections, so that when any two sections were compared, the communities composing them were as similarly as possible circumstanced in regard to manufactures, in regard to agriculture, in regard to wealth—in fact that the two differed from each other only in the degree of instruction or education—it might then be said, at least so far as statistical tests are at present available, that the two sections or classes compared were, with the exception of education, placed under exactly the same social and political conditions of society; and should the ratio of crime prevailing in those two districts differ from each other, the difference must of necessity arise from the difference existing in their degrees of education.

On referring to Table XVIII it will be seen that each group is composed of the same counties which formed the various classes or combinations in Table XIII; but it will be further seen that each of these groups is divided into two sections; the right-hand section of which—Section (*b*), will be found to contain those counties in which there is the highest degree of education—and the left-hand section, or Section (*a*), those counties with the least degree of education; and as the counties in each differ in respect of education only, the difference, if any, in the results of the respective sections of these groups will furnish the argument for or against the influence which education may have on the amount of crime.

In Group 1, Table XVIII, being the class of "least agricultural" counties, it will be found that in the section of least education there is an excess of 16·6 per cent. of crime; and excluding Lancashire, the excess of crime above the average of the country will be 25·8 per cent.; but in the section of most education the actual crime will be found under the average, at least 12·8 per cent. Again, in the group of "greatest agricultural" counties, there is an excess of 8·4 per cent. in the section of least education, and in the section of most education the excess of crime is only ·9 per cent.

In the third group, representing the "greatest manufacturing" counties, where there is least education, the excess of crime is 24·8 per cent., and excluding Lancashire, the excess is 48·4 per cent.; but in the section of highest education the excess is 24·2 per cent., and excluding Middlesex, the excess of crime is not more than 16·4 per cent. In the next group in order, that consisting of the "least manufacturing" counties, there is an excess of 4·3 with least education; and crime is 8·7 below the average where a higher degree of education prevails.

On referring, however, to Groups 5 and 6 of Table XVIII, more decidedly manufacturing and agricultural counties will be found, and in them very striking evidence of the influence of education will appear. In the manufacturing group it will be seen that in the section of least education crime is above the average 15·8 per cent.; but in the section of most education crime is below the average 7·2 per cent., and in the section

[of least education

Table XVIII.

1842–4.

Group 1.

Shewing for the Group of least Agricultural Counties the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with *Marks*.

Counties. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	Counties. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Lancashire . . .	38	2574·67	2802	Durham	26	492·08	248
Stafford	42	790·62	962	Surrey	17	844·16	728
Monmouth . . .	51	231·62	201	Northumberland .	18	371·63	197
Chester	38	590·57	792	Derby	30	406·63	276
Warwick	32	597·08	825	Gloucester . . .	28	610·47	932
		4784·56	5582			2724·97	2381
Lancashire . . .	...	2574·67	2802				
		2209·89	2780				

Group 2.

Greatest Agricultural Counties.

Counties. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	Counties. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Bedford	49	222·36	263	Bucks	14	151·30	184
Essex	47	505·46	589	Lincoln	32	542·52	433
Cambridge . . .	47	245·01	228	Hereford	38	167·80	197
Suffolk	47	442·67	492	Rutland	40	30·88	31
Hunts	44	87·50	58	Berks	41	236·77	251
		1503·00	1630	Wilts	43	376·78	424
						1506·05	1520

Group 5.

Shewing for the Group of Greatest Manufacturing Counties the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with *Marks*.

Counties. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	Counties. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Stafford	42	790·62	962	Middlesex . . .	12	2394·51	3076
Lancaster. . . .	38	2574·67	2802	Derby	30	406·63	276
Chester	38	590·57	792	Leicester	32	311·92	431
Notts	33	356·19	825	Warwick	32	597·08	825
		4312·05	5381			3710·14	4608
Lancaster. . . .	...	2574·67	2802	Middlesex . . .	...	2394·51	3076
		1737·38	2579			1315·63	1532

TABLE XVIII.—(*continued.*)

GROUP 4.

Least Manufacturing Counties.

COUNTIES. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	COUNTIES. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Cambridge . . .	47	245·01	228	Sussex	28	422·08	405
Essex	47	505·46	589	Lincoln	32	544·52	433
Huntingdon . . .	44	87·50	58	Hereford	38	167·80	197
Rutland	40	30·88	31			1134·40	1035
		868·85	906				

GROUP 5.

Shewing for the Group of Counties in which the Manufacturing Interest is 33⅓ per cent. above the Manufacturing Average, the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with *Marks*.

COUNTIES. Section (*a*)	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	COUNTIES. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Stafford	42	790·62	962	Middlesex . . .	12	2394·51	3076
Chester	38	590·57	792	Surrey	17	844·16	728
Lancaster	38	2574·67	2802	Derby	30	406·63	276
Notts	33	356·19	307	Leicester	32	311·92	431
Warwick	32	597·08	825			3957·22	4511
		4909·13	5688	Middlesex	...	2394·51	3076
Lancaster	...	2574·67	2802			1562·71	1435
		2334·46	2886				

GROUP 6.

In the following Counties the Agriculturists are above the ratio by at least double the whole average difference.

COUNTIES. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	COUNTIES. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Bedford	49	151·30	184	Bucks	14	222·36	263
Suffolk	47	422·69	492	Sussex	28	422·08	405
Cambridge . . .	47	245 01	228	Lincoln	32	542·52	433
Essex	47	505·46	589	Hereford	38	167·80	197
Hunts	44	87·50	58	Rutland	40	30·88	31
Wilts	43	376·78	424	Berks	41	236·77	251
		1788·74	1975			1622·41	1580

TABLE XVIII.—(*continued.*)

GROUP 7.

Shewing for the Group of Counties in which the Agricultural and Manufacturing Interests are nearly equal, the amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with their *Marks*.

COUNTIES. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	COUNTIES. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Hereford	50	229·57	258	Dorset	30	234·72	183
Bedford	49	151·30	184	Southampton . . .	32	521·93	510
Norfolk	42	557·46	661	Northampton . .	28	295·45	261
Salop	41	358·25	399			1052·10	954
		1296·58	1502				

GROUP 8.

Shewing for the Group of most Wealthy Counties the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with their *Marks*.

COUNTIES. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	COUNTIES. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Devon	28	732·97	535	Cumberland . . .	16	255·30	81
Gloucester . . .	28	610·47	932	Surrey	17	844·16	728
				Westmoreland . .	20	84·41	27
		1343·44	1467			1183·87	836

GROUP 9.

Counties of Least Wealth.

COUNTIES. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	COUNTIES. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Monmouth . . .	51	231·62	201	Bucks	14	222·36	263
Bedford	49	151·30	184	Derby	30	406·63	276
Hunts	44	87·50	58	Nottingham . . .	33	356·19	307
Stafford	42	790·62	962	Northampton . .	38	295·45	261
		1261·04	1405			1280·63	1107

Table XIX.

1845–8.

Group 1.

Shewing for the Group of least Agricultural Counties the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with *Marks*.

Counties. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	Counties. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Lancashire . . .	38	2511	2423	Durham	26	479	203
Stafford	42	754	719	Surrey	17	793	864
Monmouth . . .	51	234	193	Northumberland .	18	336	139
Chester	38	558	657	Derby	30	364	199
Warwick	32	560	778	Gloucester . . .	28	548	783
		4617	4770			2520	2188
Lancashire . . .	...	2511	2423				
		2106	2347				

Group 2.

Greatest Agricultural Counties.

Counties. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	Counties. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Bedford	49	134	159	Bucks	14	192	289
Essex	47	444	529	Lincoln	32	485	365
Cambridge . . .	47	222	217	Hereford	38	145	171
Suffolk	47	382	393	Rutland	40	27	31
Hunts	44	75	74	Berks	41	211	256
				Wilts	43	330	378
		1257	1372			1390	1490

Group 3.

Shewing for the Group of greatest Manufacturing Counties the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with *Marks*.

Counties. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	Counties. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Stafford	42	754	719	Middlesex . . .	12	2218	3558
Lancaster . . .	38	2511	2423	Derby	30	364	199
Chester	38	558	657	Leicester	32	274	295
Notts	33	318	267	Warwick	32	560	778
		4141	4066			3416	4830
Lancaster . . .	...	2511	2423	Middlesex . . .	...	2218	3558
		1630	1643			1198	1272

TABLE XIX.—(*continued.*)

GROUP 4.

Least Manufacturing Counties.

COUNTIES. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	COUNTIES. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Cambridge . . .	47	222	217	Sussex	28	377	395
Essex	47	444	529	Lincoln	32	485	365
Hunts	44	75	74	Hereford	38	145	171
Rutland	40	27	31			1007	931
		768	851				

GROUP 5.

Shewing for the Group of Counties in which the Manufacturing Interest is 33⅓ per cent. above the Manufacturing Average, the amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with *Marks*.

COUNTIES. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	COUNTIES. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Stafford	42	754	719	Middlesex . . .	12	2218	3558
Chester	38	558	657	Surrey	17	793	864
Lancaster	38	2511	2423	Derby	30	364	199
Notts	33	318	267	Leicester	32	274	295
Warwick	32	560	778			3649	4916
		4701	4844	Middlesex . . .	...	2218	3558
Lancaster . . .	...	2511	2423			1431	1358
		2190	2421				

GROUP 6.

In the following Counties the Agriculturists are above the ratio by at least double the whole average difference.

COUNTIES. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	COUNTIES. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Bedford	49	134	159	Bucks	14	211	256
Suffolk	47	382	393	Sussex	28	377	395
Cambridge . . .	47	222	217	Lincoln	32	485	365
Essex	47	444	529	Hereford	38	145	171
Hunts	44	75	74	Rutland	40	27	31
Wilts	43	330	378	Berks	41	211	256
		1587	1750			1456	1474

Table XIX.—(*continued.*)

Group 7.

Shewing for the Group of Counties in which the Agricultural and Manufacturing Interests are nearly equal, the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with their *Marks*.

Counties. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	Counties. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Hereford	50	145	171	Dorset	30	206	210
Bedford	49	134	159	Southampton	32	473	550
Norfolk	42	499	583	Northampton	28	263	236
Salop	41	311	214			942	996
		1089	1127				

Group 8.

Shewing for the Group of most Wealthy Counties the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with their *Marks*.

Counties. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	Counties. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Devon	28	643	520	Cumberland	16	222	90
Gloucester	28	548	783	Surrey	17	793	864
				Westmoreland	20	55	43
		1191	1303			1070	997

Group 9.

Counties of Least Wealth.

Counties. Section (*a*).	Highest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.	Counties. Section (*b*).	Lowest Proportion. Ratio signing with Marks.	Calculated Average.	Actual Crime.
Monmouth	51	234	193	Bucks	14	192	289
Bedford	49	134	159	Derby	30	364	199
Hunts	44	75	74	Nottingham	33	318	267
Stafford	42	754	719	Northampton	38	263	236
		1197	1145			1137	991

of least education, if Lancaster be excluded, the excess of crime will be 23·2 per cent. Again, in the decidedly agricultural counties, with the lowest grade of education crime is in excess 10·4 per cent.; but with the higher scale of education, there is less crime than the average of the country by 2·6 per cent. In the 7th group of the same Table, containing the counties in which the manufacturing and agricultural interests are nearly equal, it will be found to bear similar evidence to the influence of education on crime. For with the inferior degree of education there is an excess of crime of 15·8 per cent.; but with the comparatively higher degree of instruction, crime is 9·3 per cent. below the average.

The 8th and 9th groups in Table XVIII furnish a still more remarkable proof of the same principle. On referring to Table XII, it will be found that crime in both of these groups was below the average of the whole kingdom; but here, when sub-divided according to the means of education, it is found in the group of greatest wealth that the section of least education shews an excess of crime amounting to 9·2 per cent., and that the section of most education is 29·4 per cent. below the average in crime. The results for the group of least wealth go to establish the same fact; there being an excess of 11·3 per cent. with the least degree of education, and with the best education a less amount of crime than the average by 13·5 per cent.

It is thus found that in every instance an increase of crime is associated with a low state of education; but where a better state of education prevails, there is as constantly found to be a less amount of crime. The following Abstracts will give a condensed view of the results obtained from Table XVIII.

Group of Counties.	Inferior Degree of Education.				Higher Degree of Education.			
	Calculated Crime.		Actual Crime.		Calculated Crime.		Actual Crime.	
	1842—4.	1845—8.	1842—4.	1845—8.	1842—4.	1845—8.	1842—4.	1845—8.
Least Agricultural . . .	2209·89	2106	2780	2347	2724·97	2520	2381	2188
Greatest ditto	1503·00	1257	1630	1372	1506·05	1390	1520	1490
Greatest Manufacturing .	1737·38	1630	2579	1643	1315·63	1198	1532	1272
Least ditto	868·85	768	906	851	1134·40	1007	1035	931
Manufacturing interest, 33⅓ per cent. above the average	2334·46	2190	2886	2421	1562·71	1431	1435	1358
Agricultural interest, 50 per cent. above the average .	1788·74	1587	1975	1750	1622·41	1456	1580	1474
Manufacturing and Agricultural interests nearly equal	1296·58	1089	1502	1127	1052·10	942	954	996
Greatest Wealth	1343·44	1191	1467	1303	1183·87	1070	836	997
Least Wealth	1261·04	1197	1405	1145	1280·63	1137	1107	991
Total	14343·38	13015	17130	13959	13382·77	12151	12380	11697

An examination of the preceding figures cannot fail to render manifest the powerful influence which even the simple qualification of individuals being able to sign their names, has on the amount of crime in the various districts of the country. Contrasting the totals for the various sections of each group of counties, it will be seen that, in the section of inferior education, the excess of crime is 19·4 per cent., while in the section of higher education there is 7·5 per cent. less crime than the average of the kingdom.

In the next Abstract, the difference per cent. between the actual crime in each of the preceding groups, and the average rate for the whole of England and Wales, is given. When the amount of crime is above the average, the result will be distinguished by the sign +, and that the actual crime is below the average, will be expressed by the sign —.

Group of Counties.	Difference of Crime.				Difference per cent. in favour of Education.	
	Inferior Degree of Education.		Higher Degree of Education.			
	1842—4.	1845—8.	1842—4.	1845—8.	1842—4.	1845—8.
Least Agricultural	+ 28·8	+ 11·5	— 12·6	— 13·2	38·4	24·7
Greatest ditto	+ 8·4	+ 9·1	+ 0·9	+ 7·2	7·5	1·9
Greatest Manufacturing	+ 48·4	+ ·8	+ 16 4	+ 6 2	32·0	— 5·4
Least ditto	+ 4·3	+ 10·9	— 8·7	— 7·5	13 0	18·4
Manufacturing interest, 33⅓ per cent. above the average	+ 23·2	+ 10·5	— 7·2	— 5·1	30·4	15·6
Agricultural interest, 50 per cent. above the average	+ 10·4	+ 10·3	— 2·6	+ 1·2	13·0	9·1
Manufacturing and Agricultural interests nearly equal	+ 15·8	+ 3·5	— 9·3	+ 5·7	25·1	— 2·2
Greatest Wealth	+ 9·2	+ 9·4	— 29·4	— 6·8	38·6	16·2
Least Wealth	+ 11·3	— 4·4	— 13·5	— 12·8	24·8	8·4
Total average of preceding Groups	+ 19·4	+ 7·2	— 7·5	— 3·7	26·9	16·9
Group in which those signing with "marks" exceed the average by 33⅓ per cent.	+ 13·2	+ 14·6			43·9	35·6
Group in which those signing with "marks" are less than the average by 25 per cent.	...	...	— 30·7	— 21·0		

The last column of the preceding Abstract shews the difference per cent. in the rate of crime in the badly-educated sections of each group, over that which prevails in the better-educated sections of the same group: and it must be regarded as a powerful argument in favour of even the small degree of education or instruction here recognised, that not a single instance has appeared in which a marked, and generally a most striking difference, averaging above 25 per cent., does not shew itself in favour of the better educated districts. All the other combinations and arrangements made to determine the active element in the increase and decrease of crime were unsuccessful, and produced no

[satisfactory result;

Table XX.

Counties in which the actual Crime exceeds the Average Ratio for England and Wales.—Males.

1842–4.

Counties.		Ratio of whole Population engaged in		Proportion of Males signing with Marks the Marriage Registers.	Ratio of Persons of Independent Means.	Crime.		
		Agriculture.	Manufacture.			Calculated.	Actual.	Difference per Cent.
Counties in which the excess of crime is under 15 per cent.	Berks	13·2	10·2	41	3·0	236·77	251	5·9
	Herts	12·8	12·8	50	2·4	229·57	258	12·2
	Kent	8·7	10·2	29	3·4	810·18	835	3·1
	Lancaster	3·0	28·1	38	2·0	2574·67	2802	8·8
	Norfolk	12·2	11·8	42	2·5	575·46	661	14·9
	Oxford	12·9	10·7	35	2·4	236·77	265	11·8
	Rutland	15·6	9·2	40	2·0	30·88	31	·4
	Salop	11·7	11·9	41	2·2	358·25	399	11·4
	Suffolk	13·9	10·0	47	2·4	442·67	492	11·1
	Wilts	14·1	10·8	43	2·3	376·78	424	12·5
	Total					5872·00	6418	9·3
Counties in which the excess of crime is 15 per cent. and under 30 per cent.	Bedford	13·8	13·3	49	1·6	151·30	184	21·8
	Bucks	14·0	12·6	14	2·0	222·36	263	18·5
	Essex	14·8	9·3	47	2·2	505·46	589	16·6
	Hereford	14·6	9·9	38	2·9	167·80	197	17·3
	Middlesex	1·1	20·0	12	4·9	2394·51	3076	28·4
	Somerset	10·2	13·0	37	3·4	659·34	843	27·9
	Stafford	5·7	18·7	42	1·6	790·62	962	21·6
	Total					4891·39	6114	25·0
Counties in which the excess of crime is 30 per cent. and upwards.	Chester	6·7	23·5	38	2·1	590·57	792	34·2
	Gloucester	7·2	15·1	28	3·7	610·47	932	52·8
	Leicester	7·9	19·2	32	2·0	311·92	431	38·1
	Worcester	10·1	16·7	46	2·3	337·66	516	52·7
	Warwick	6·0	21·9	32	...	597·08	825	38·2
	Total					2447·70	3496	42·8

Note.—In England and Wales the average ratio of the whole population :—
Engaged in Agriculture . . . . . = 7·9 per cent.
... Manufactures . . . . . = 16·5 ...
Signing their names with Marks (Males) . . . . . = 33·0 ...
Of Independent Means . . . . . = 2·8 ...

TABLE XX.—(*continued.*)

Counties in which the actual Crime is less than the Average Ratio for England and Wales.—Males.

1842–4.

Counties.		Ratio of whole Population engaged in		Proportion of Males signing with Marks the Marriage Registers.	Ratio of Persons of Independent Means.	Crime.		
		Agriculture.	Manufacture.			Calculated.	Actual.	Difference per Cent.
Counties in which Crime is below the average of England and Wales by not more than 15 per cent.	Cambridge	13·9	8·9	47	2·4	245·01	228	6·9
	Monmouth	6·5	13·1	51	1·9	231·62	201	13·3
	Northampton	12·9	13·5	38	1·9	295·45	261	11·5
	Notts	8·2	20·6	33	1·9	356·19	307	13·8
	Southampton	10·0	10·6	32	3·3	521·93	510	2·3
	Surrey	4·4	16·2	17	4·2	844·16	728	13·7
	Sussex	11·9	9·7	28	3·0	422·08	405	4·0
	Total					2916·44	2640	9·4
Counties in which the difference is 15 and under 30 per cent.	Devon	10·2	13·0	28	3·8	732·97	535	27·0
	Dorset	10·9	11·1	30	3·2	234·72	183	22·1
	Lincoln	15·9	9·6	32	2·5	542·52	433	20·1
	York	13·8 to 4·3	11·6 to 24·6	21 to 37	1·9 to 4·1	2397·60	1818	24·2
	Total					3907·81	2969	24·0
Counties in which the difference is 30 per cent. and upwards.	Cumberland	8·8	14·6	16	3·7	255·30	81	68·2
	Cornwall	7·9	9·3	35	2·7	473·55	215	54·5
	Derby	7·1	18·9	30	1·9	406·63	276	32·2
	Durham	4·4	13·9	26	2·5	492·08	248	49·6
	Hunts	14·5	9·2	44	2·0	87·50	58	33·3
	Northumberland	6·9	14·9	18	2·8	371·63	197	47·0
	Westmoreland	11·6	13·8	20	4·0	84·41	27	67·8
	Total					2171·10	1102	49·2
Wales		10·3 to 12·7	9·0 to 10·5	46 to 48	2·6	1323·87	550	58·4

Table XXI.

Counties in which the Actual Crime exceeds the Average Ratio for England and Wales.—Males.

1845–8.

Counties.		Ratio of whole Population engaged in		Proportion of Males signing with Marks the Marriage Registers.	Ratio of Persons of Independent Means.	Crime.		
		Manufacture.	Agriculture.			Calculated.	Actual.	Difference per Cent.
Counties in which the excess of Crime is under 15 per cent.	Dorset	10·9	11·1	30	3·2	206	210	1·9
	Leicester	7·9	19·2	32	2·0	274	295	7·6
	Rutland	15·6	9·2	40	2·0	27	31	14·8
	Suffolk	13·9	10·0	47	2·4	382	393	2·9
	Surrey	4·4	16·2	17	4·2	793	864	8·9
	Sussex	11·9	9·7	28	3·0	377	395	4·8
	Wilts	14·1	10·8	43	2·3	330	378	14·5
	Total					2389	2566	7·4
Counties in which the excess of Crime is 15 per cent. and under 30 per cent.	Bedford	13·8	13·3	49	1·6	134	159	18·6
	Berks	13·2	10·2	41	3·0	211	256	21·3
	Chester	6·7	23·5	38	2·1	558	657	17·7
	Essex	14·8	9·3	47	2·2	444	529	19·1
	Hereford	14·6	9·9	38	2·9	145	171	17·9
	Herts	12·8	12·8	50	2·4	200	246	23·0
	Norfolk	12·2	11·8	42	2·5	499	583	16·8
	Oxford	12·9	10·7	35	2·4	205	240	17·1
	Somerset	10·2	13·0	37	3·4	546	639	17·0
	Southampton	10·0	10·6	32	3·3	473	550	16·3
	Total					3415	4030	18·0
Counties in which the excess of Crime is 30 per cent. and upwards.	Bucks	14·0	12·6	14	2·0	192	289	50·5
	Gloucester	7·2	15·1	28	3·7	548	783	42·9
	Middlesex	1·1	20·0	12	4·9	2218	3558	60·4
	Warwick	6·0	21·9	32	...	560	778	38·9
	Worcester	10·1	16·7	46	2·3	300	471	57·0
	Total					3818	5879	54·0

TABLE XXI.—(*continued.*)

Counties in which the Actual Crime is less than the Average Ratio for England and Wales.—Males.

1845–8.

Counties.		Ratio of the whole Population engaged in		Proportion of Males signing with Marks the Marriage Registers.	Ratio of Persons of Independent Means.	Crime.		
		Agriculture.	Manufacture.			Calculated.	Actual.	Difference per Cent.
Counties in which crime is below the average of England and Wales by not more than 15 per cent.	Cambridge	13·9	8·9	47	2·4	222	217	2·2
	Cumberland	8·8	14·6	16	3·7	222	90	14·4
	Hunts	14·5	9·2	44	2·0	75	74	1·3
	Kent	8·7	10·2	29	3·4	741	710	4·2
	Lancaster	3·0	28·1	38	2·0	2511	2423	3·5
	Northampton	12·9	13·5	38	1·9	263	236	10·3
	Stafford	5·7	18·7	42	1·6	754	719	4·7
	Total					4788	4469	6·7
Counties in which the difference is 15 and under 30 per cent.	Devon	10·2	13·0	28	3·8	643	520	19·1
	Lincoln	15·9	9·6	32	2·5	485	365	24·7
	Monmouth	6·5	13·1	51	1·9	234	193	17·5
	Notts	8·2	20·6	33	1·9	318	267	16·0
	Westmoreland	11·6	13·8	20	4·0	55	43	21·8
	Total					1735	1388	20·0
Counties in which the difference is 30 per cent. and upwards.	Cornwall	7·9	9·3	35	2·7	419	222	47·0
	Derby	7·1	18·9	30	1·9	364	199	45·3
	Durham	4·4	13·9	26	2·5	479	203	57·6
	Northumberland	6·9	14·9	18	2·8	336	139	58·6
	Salop	11·7	11·9	41	2·2	311	214	31·2
	York	13·8 to 4·3	11·6 to 24·6	21 to 37	1·9 to 4·1	2252	1363	39·5
	Total					4161	2340	43·8

Table XXII.

Criminal Offenders in England and Wales in 1845, 1846, 1847, *and* 1848, *with the Ratio of Crime to the Population at the various terms of Life, calculated to the corrected Population at the respective periods.—Males.*

Age.		Population.		Criminals.		Ratio of Criminals to Total Population per cent.
Under 5 . .	1845	1,099,110				
	1846	1,112,263				
	1847	1,125,574				
	1848	1,139,045				
			4,475,992			
5 to 10 . .	1845	992,027				
	1846	1,002,019				
	1847	1,012,112				
	1848	1,022,306				
			4,028,464			
10 ... 15 . .	1845	914,109				
	1846	922,719				
	1847	931,412				
	1848	940,186				
			3,708,426			
Under 15 . .	1845	3,005,246		1361		
	1846	3,037,001		1451		
	1847	3,069,098		1538		
	1848	3,101,537		925		
			12,212,882		5275	·0432
15 to 20 . .	1845	822,186		4785		
	1846	832,620		4980		
	1847	843,187		5700		
	1848	853,887		6001		
			3,351,880		21466	·6404
20 ... 25 . .	1845	780,262		4804		
	1846	788,732		4757		
	1847	797,296		5362		
	1848	805,952		6340		
			3,172,242		21263	·6702
25 ... 30 . .	1845	613,063		2771		
	1846	619,721		2860		
	1847	626,450		3356		
	1848	633,251		3826		
			2,492,485		12813	·5141
30 ... 40 . .	1845	1,063,952		3092		
	1846	1,080,488		3100		
	1847	1,097,281		3788		
	1848	1,114,335		4133		
			4,356,056		14113	·3240
40 ... 50 . .	1845	796,361		1528		
	1846	808,591		1661		
	1847	821,009		1929		
	1848	833,617		2125		
			3,259,578		7243	·2222
50 ... 60 . .	1845	537,321		662		
	1846	547,936		664		
	1847	558,761		802		
	1848	569,799		826		
			2,213,817		2954	·1334
60 and upwards	1845	555,807		338		
	1846	561,452		377		
	1847	567,154		428		
	1848	572,914		410		
			2,257,327		1553	·0688
Proportion ;—1 in 384 .			33,316,267		86680	·2602

Table XXIII.

Criminal Offenders in England and Wales in 1845, 1846, 1847, *and* 1848, *with the Ratio of Crime to the Population at the various terms of Life, calculated to the corrected Population for the respective Periods.—Females.*

Age.		Population.		Criminals.		Ratio of Criminals to Total Population per cent.
Under 5 . .	1845	1,103,645				
	1846	1,115,216				
	1847	1,126,908				
	1848	1,138,723				
			4,484,492			
5 to 10 . .	1845	988,471				
	1846	997,724				
	1847	1,007,062				
	1848	1,016,488				
			4,009,745			
10 ... 15 . .	1845	891,021				
	1846	900,944				
	1847	911,150				
	1848	921,126				
			3,624,241			
Under 15 . .	1845	2,983,137		220		
	1846	3,013,884		217		
	1847	3,045,120		256		
	1848	3,076,337		178		
			12,118,478		871	·0072
15 to 20 . .	1845	844,078		1179		
	1846	853,923		1259		
	1847	863,883		1370		
	1848	873,959		1338		
			3,435,843		5146	·1498
20 ... 25 . .	1845	848,830		1193		
	1846	854,156		1197		
	1847	859,515		1360		
	1848	864,910		1411		
			3,427,411		5161	·1506
25 ... 30 . .	1845	689,803		768		
	1846	694,132		856		
	1847	698,488		915		
	1848	702,871		915		
			2,785,294		3454	·1240
30 ... 40 . .	1845	1,122,776		788		
	1846	1,141,008		938		
	1847	1,159,537		1106		
	1848	1,178,365		1041		
			4,601,686		3873	·0842
40 ... 50 . .	1845	833,126		497		
	1846	847,429		494		
	1847	861,978		570		
	1848	876,777		523		
			3,419,310		2084	·0609
50 ... 60 . .	1845	575,100		228		
	1846	587,030		210		
	1847	599,208		246		
	1848	611,639		229		
			2,372,977		913	·0385
60 and upwards	1845	642,365		89		
	1846	649,980		86		
	1847	657,685		107		
	1848	665,482		128		
			2,615,512		410	·0157
Proportion ;—1 in 1587			34,776,511		21,912	·0630

satisfactory result; in fact, they did not lead to the discovery of any condition or circumstance of life which was peculiar to one district more than another; but, as soon as the educational test is introduced, it immediately analyzes groups and districts into a uniform and regular series, which before shewed the most contradictory results. If a few exceptions appeared, they might suggest the propriety of a still further refinement in the analysis; but the regularity is so remarkable, that it immediately becomes evident that at least one very powerful element in the question has been determined, and one on which legislative and preventive measures may easily be founded, for the reduction of crime and the elevation of the moral condition of the people.

On a careful consideration of the evidence and facts brought forward, it will be seen that, although the peculiarities in the mining, manufacturing, agricultural, and other conditions of the population are not sufficient to account for the great differences in the degree of crime prevailing in various districts, still it is clear, that the results arising out of those peculiar conditions are such as to shew that they exercise a secondary influence on the question of crime, and therefore ought not to be overlooked in any complete investigation.

The preceding Table, XX, was formed in order to shew, that in those districts in which there was an equal difference in the amount of crime from the average of the country, no peculiar element could be traced which was common to all the counties composing each group.

In connection with the results, adduced in the preceding part of this paper, it will be important to view the amount of education among criminals themselves.

Degree of Education amongst Male Criminals in England and Wales during the four years 1836–9, *the three years* 1842–4, *and the four years* 1845–8.

Degree of Instruction.	Four Years, 1836-9.	Three Years, 1842-4.	Four Years, 1845-8.	Eleven Years, 1836-9, 1842-8.
Number who could neither read nor write	25111	21779	25896	72786
Number who could read and write imperfectly . .	39646	41620	50560	131826
Number who could read and write well	8325	5909	8252	22486
Number of superior Education	422	308	324	1054
Total	73504	69616	85032	228152
Number whose Instruction could not be ascertained	1887	1924	1648	5459
Grand Total	75391	71540	86680	233611

Degree of Instruction.	Four Years, 1836-9.	Three Years, 1842-4.	Four Years, 1845-8.	Eleven Years, 1836-9, 1842-8.
Ratio of Criminals who could neither read nor write . .	34·2	31·3	30·4	31·9
... ... who could read and write imperfectly	53·9	59·8	59·5	57·8
... ... who could read and write well . .	11·3	8·5	9·7	9·8
... ... who possessed superior education .	0·6	0·4	0·4	0·5

It is thus curious to observe, that while the proportion of criminals who could neither read nor write was 31·9 per cent., the ratio of persons who signed their marriage register with marks, (that is, were unable to write their names) was 32 per cent.; and it might thence be inferred that, from the small difference in those two ratios, education could have no very important effect in repressing or augmenting the number of criminals: but the number of persons signing their marriage registers with marks should not be taken as the absolute, but only as the relative degree of education in different districts; and it should be borne in mind, that although 32·0 is the average for the whole of England and Wales for the years 1836–48, there are some districts in which the proportion is as low as 12 and 14 per cent., and others in which the ratio is as high as 50 and 51 per cent.; and it has also been already shewn, that no reliance can be placed on the mere gross average results thus given, but that it is imperatively necessary to separate the whole into groups, in which the influences of wealth, manufactures, and agriculture are common—in fact, into groups differing in respect of education only, so as to furnish a proper argument for or against the influence which education may have on the amount of crime.

According to the returns of the Registrar General, the proportion of males signing their marriage registers with marks has gradually decreased from 33·7 per cent. in 1839, to 31·2 per cent. in 1848. It also appears that during the same years the number of criminals unable to read or write has decreased from 33·5 per cent. in the former year to 31·9 per cent. in the latter; from the year 1839 the ratio had gradually fallen to 29·8 per cent. in 1844, and had again pretty uniformly increased to 31·9 per cent. in the year 1848; but it does not follow on this account that education is favourable to crime, for it may happen that increased temptations over the country generally have arisen within that period; and the question would still remain open, whether in the higher educated districts crime was greater or less than in the lower educated districts, all the other conditions of those districts being the same.

Adopting the test furnished by the records of the Registrar General, it is obvious that in those counties in which there is an inferior degree of education, there is also an increased ratio of crime; and that not a small and barely appreciable difference, but in 11 different groups of counties into which the whole of England and Wales is divided, shewing a difference in favour of the best educated districts varying from 13 to 43·9 per cent., and averaging 25 per cent. for the whole of England and Wales. It is thus evident, that so far as the test now furnished is available, more conclusive evidence could not be called for.

[This test, however,

Table XXIV.

Shewing the Degree of Instruction among the Criminals in those Counties where Crime exceeds the Average Ratio of England and Wales.—Males.

1842–3–4.

Counties.		Neither Read nor Write.		Read and Write imperfectly.		Read and Write well.		Superior Education.		Instruction could not be ascertained.		Total.
		Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	
Counties in which the excess of crime is under 15 per cent.	Berks	210	...	531	...	30	...	1	...	34	...	806
	Herts	304	...	436	...	30	...	3	...	16	...	789
	Kent	827	...	1550	...	113	...	7	...	60	...	2557
	Lancaster	3220	...	4624	...	518	...	36	...	186	...	8584
	Norfolk	756	...	1015	...	202	...	6	...	28	...	2007
	Oxford	258	...	516	...	23	...	...	...	24	...	821
	Rutland	28	...	52	...	13	...	...	...	3	...	96
	Salop	456	...	693	...	28	...	3	...	25	...	1205
	Suffolk	517	...	815	...	134	...	4	...	32	...	1502
	Wilts	299	...	839	...	96	...	15	...	14	...	1263
	Total	6875	35·8	11071	57·6	1187	6·2	75	·4	422	2·1	19630
Counties in which the excess of crime is 15 per cent. and under 30 per cent.	Beds	248	...	295	...	5	...	...	...	3	...	551
	Bucks	304	...	436	...	42	...	5	...	12	...	799
	Essex	741	...	962	...	56	...	8	...	24	...	1791
	Hereford	243	...	340	...	9	...	...	...	3	...	595
	Middlesex	1976	...	5405	...	1670	...	29	...	384	...	9464
	Somerset	933	...	1371	...	222	...	2	...	164	...	2692
	Stafford	887	...	1608	...	360	...	27	...	101	...	2983
	Total	5332	29·3	10417	57·3	2364	13·0	71	·4	691	3·7	18875
Counties in which the excess of crime is 30 per cent. and upwards	Chester	732	...	1519	...	99	...	26	...	17	...	2393
	Gloucester	801	...	1853	...	136	...	6	...	70	...	2866
	Leicester	361	...	769	...	159	...	1	...	12	...	1302
	Worcester	564	...	925	...	55	...	9	...	45	...	1598
	Warwick	853	...	1315	...	275	...	29	...	17	...	2489
	Total	3311	31·6	6381	60·8	724	6·9	71	·7	161	1·5	10648
	Grand Total	15518	32·4	27869	58·2	4275	8·9	217	·5	1274	2·6	49153

TABLE XXIV.—MALES.—(*continued.*)

Instruction among the Criminals in those Counties where Crime is below the Average Ratio of England and Wales.

COUNTIES.		Neither Read nor Write.		Read and Write imperfectly.		Read and Write well.		Superior Education.		Instruction could not be ascertained.		Total.
		Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	
Counties in which crime is below the average of England and Wales by not more than 15 per cent.	Cambridge	201	...	434	...	45	...	4	...	8	...	692
	Monmouth	157	...	356	...	88	...	3	..	18	...	622
	Northampton	271	...	456	...	53	...	1	...	32	...	813
	Notts	288	...	577	...	56	...	1	...	10	...	932
	Southampton	403	...	1005	...	111	...	10	...	22	...	1551
	Surrey	595	...	1255	...	331	...	4	...	33	...	2218
	Sussex	377	...	776	...	62	...	...	...	4	...	1219
	Total	2292	28·94	4859	61·35	746	9·4	23	·3	127	1·6	8047
Counties in which the difference is 15 and under 30 per cent.	Devon	440	...	967	...	209	...	8	...	25	...	1649
	Dorset	206	...	296	...	47	...	3	...	27	...	579
	Lincoln	329	...	867	...	87	...	7	...	44	...	1334
	York	1439	...	3661	...	311	...	34	...	70	...	5515
	Total	2414	27·1	5791	65·0	654	7·3	52	·6	166	1·8	9077
Counties in which the difference is 30 per cent. and upwards.	Cumberland	69	...	135	...	35	...	...	...	6	...	245
	Cornwall	173	...	430	...	35	...	1	...	15	...	654
	Derby	208	...	577	...	16	...	2	...	27	...	830
	Durham	257	...	456	...	34	...	1	...	14	...	762
	Hunts	65	...	111	...	3	...	...	...	3	...	182
	Northumberland	153	...	412	...	21	...	3	...	45	...	634
	Westmoreland	8	...	65	...	6	...	2	..	1	...	82
	Total	933	28·5	2186	66·6	150	4·57	9	·27	111	3·3	3389
	Grand Total	5639	28·0	12836	63·8	1550	7·7	84	·4	404	2·0	20513
	England	21157	31·1	40705	59·9	5825	8·5	301	·5	1678	2·4	69666
	Wales	622	38·2	915	56·2	84	5·1	7	·4	246	13·1	1874
	England and Wales	21779	31·3	41620	59·8	5909	8·5	308	·44	1924	2·7	71540

Table XXV.

Instruction among the Criminals in those Counties where Crime is below the Average Ratio of England and Wales.—Males.

1845–6–7–8.

Counties.		Neither Read nor Write.		Read and Write imperfectly.		Read and Write well.		Superior Education.		Instruction could not be ascertained.		Total.
		Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	
Counties in which Crime is below the average of England and Wales by not more than 15 per cent.	Cambridge	265	...	535	...	64	...	3	...	17	...	884
	Monmouth	195	...	509	...	66	...	1	...	4	...	775
	Northampton	301	...	598	...	46	...	2	...	17	...	964
	Notts	327	...	662	...	79	...	3	...	5	...	1076
	Southampton	655	...	1414	...	115	...	16	...	31	...	2231
	Surrey	849	...	2140	...	459	...	9	...	45	...	3502
	Sussex	454	...	1047	...	74	...	1	...	15	...	1591
	Total	3046	27·97	6905	63·42	903	82·9	35	0·32	134	1·21	11023
Counties in which the difference is 15 and under 30 per cent.	Devon	812	...	1375	...	271	...	9	...	47	...	2514
	Dorset	273	...	467	...	94	...	7	...	24	...	865
	Lincoln	432	...	915	...	107	...	6	...	16	...	1476
	York	1463	...	3639	...	320	...	18	...	88	...	5528
	Total	2980	29·20	6396	62·66	792	7·75	40	0·39	175	1·68	10383
Counties in which the difference is 30 per cent. and upwards.	Cumberland	85	...	234	...	42	...	...	...	10	...	371
	Cornwall	293	...	538	...	48	...	7	...	4	...	890
	Derby	196	...	570	...	22	...	2	...	27	...	817
	Durham	272	...	510	...	30	...	...	...	25	...	837
	Hunts	87	...	198	...	10	...	...	...	4	...	299
	Northumberland	130	...	398	...	22	...	4	...	11	...	565
	Westmoreland	37	...	126	...	5	...	2	...	5	...	175
	Total	1100	28·44	2574	66·54	179	4·63	15	0·39	86	2·17	3954
	Grand Total	7126	28·54	15875	63·59	1874	7·51	90	0·36	395	1·56	25360
England		25135	30·33	49369	59·57	8056	9·72	314	0·38	1517	1·79	84391
Wales		761	35·27	1191	55·19	196	9·08	10	0·46	131	5·72	2289
England and Wales		25896	30·45	50560	59·46	8252	9·71	324	0·38	1648	1·94	86680

Table XXV.—Males.—*(continued.)*

Counties.		Neither Read nor Write.		Read and Write imperfectly.		Read and Write well.		Superior Education.		Instruction could not be ascertained.		Total.
		Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	Actual Number.	Proportion per Cent.	
Counties in which the excess of crime is under 15 per cent.	Berks	349	...	639	...	33	...	2	...	5	...	1028
	Herts	403	...	460	...	112	...	6	...	36	...	1017
	Kent	1031	...	1613	...	173	...	13	...	60	...	2890
	Lancaster	3192	...	5837	...	613	...	47	...	161	...	9850
	Norfolk	921	...	1096	...	306	...	1	...	36	...	2360
	Oxford	280	...	634	...	43	...	2	...	10	...	969
	Rutland	45	...	64	...	13	...	...	...	1	...	123
	Salop	331	...	508	...	12	...	...	...	8	...	859
	Suffolk	528	...	906	...	124	...	9	...	29	...	1596
	Wilts	351	...	1020	...	133	...	5	...	16	...	1525
	Total	7431	34·00	12777	58·46	1562	7·15	85	·39	362	1·63	22217
Counties in which the excess of crime is 15 and under 30 per cent.	Bedford	252	...	343	...	41	...	...	...	8	...	644
	Bucks	354	...	666	...	51	...	5	...	29	...	1105
	Essex	830	...	1169	...	102	...	14	...	29	...	2144
	Hereford	315	...	361	...	9	...	...	...	4	...	689
	Middlesex	3350	...	8488	...	2334	...	17	...	304	...	14493
	Somerset	908	...	1287	...	356	...	1	...	105	...	2657
	Stafford	902	...	1618	...	319	...	22	...	109	...	2970
	Total	6911	28·66	13932	57·78	3212	13·32	59	0·24	588	2·38	24702
Counties in which the excess of crime is 30 per cent. and upwards.	Chester	895	...	1536	...	177	...	20	...	40	...	2668
	Gloucester	836	...	1686	...	590	...	22	...	53	...	3187
	Leicester	279	...	700	...	201	...	...	...	10	...	1190
	Worcester	666	...	1162	...	52	...	8	...	41	...	1929
	Warwick	991	...	1701	...	388	...	30	...	28	...	3138
	Total	3667	30·71	6785	56·83	1408	11·79	80	0·67	172	1·42	12112
	Grand Total	18009	31·10	33494	57·84	6182	10·67	224	0·39	1122	1·90	59031

This test, however, being derived from a source partly independent of the criminals themselves, has led to a similar analysis of an educational test to be derived from among the criminal population. The Home Office returns shew for each year the number of criminals *who can neither read nor write—who can read and write imperfectly—who can read and write well—and who have a superior education.*

Attention will first be given to the first two classes of criminals. The various counties of England have been divided into six different groups, in the first two of which the ratio of crime does not differ by 15 per cent. above and below the average for England and Wales. In the next two groups the difference of crime is from 15 to 30 per cent. above and below the average. And in the last two groups the difference is at least 30 per cent. above and below the average respectively. For each of these groups the educational condition of the criminals has been abstracted; the detailed results of which are given in the preceding Table, XXIV, from which the following Abstract is taken:—

Groups of Counties in which the	1842–4.									
	Above the Average Crime.					Below the Average Crime.				
	Number who could neither Read nor Write.	Number who could Read and Write imperfectly.	Number who could Read and Write well.	Of superior Education.	Instruction could not be ascertained	Number who could neither Read nor Write.	Number who could Read and Write imperfectly.	Number who could Read and Write well.	Of superior Education.	Instruction could not be ascertained.
Difference of crime under 15 per cent.	6875	11071	1187	75	422	2292	4859	746	23	127
Difference, 15 per cent. and under 30 per cent. . .	5332	10417	2364	71	691	2414	5791	654	52	166
Difference, 30 per cent. and upwards	3311	6381	724	71	161	933	2186	150	9	111

Groups of Counties in which the	1842–4.									
	Above the Average Crime.					Below the Average Crime.				
	Ratio which could neither Read nor Write.	Ratio which could Read and Write imperfectly.	Ratio which could Read and Write well.	Ratio of Superior Education.	Instruction could not be ascertained.	Ratio which could neither Read nor Write.	Ratio which could Read and Write imperfectly.	Ratio which could Read and Write well.	Ratio of Superior Education.	Instruction could not be ascertained.
Difference of crime under 15 per cent.	35·8	57·6	6·2	·4	2·1	28·9	61·3	9·4	·3	1·6
Difference, 15 per cent. and under 30 per cent. . .	29·3	57·3	13·0	·4	3·7	27·1	65·0	7·3	·6	1·8
Difference, 30 per cent. and upwards	31·6	60 8	6·9	·7	1·5	28·5	66·6	4·6	·3	3·3
Total of these Districts	32·4	58·2	8·9	·5	2·6	28·0	63·8	7·7	·4	2·0
Ratio of England and Wales . .	31·3	59·8	8·5	·44	2·7					

Group of Counties in which the	1845–8. Above the Average Crime. Number who could neither Read nor Write.	Number who could Read and Write imperfectly	Number who could Read and Write well.	Of superior Education.	Instruction could not be ascertained.	1845–8. Below the Average Crime. Number who could neither Read nor Write.	Number who could Read and Write imperfectly.	Number who could Read and Write well.	Of superior Education.	Instruction could not be ascertained.
Difference of crime under 15 per cent.	7431	12777	1562	85	362	3016	6905	903	35	134
Difference, 15 per cent. and under 30 per cent. . .	6911	13932	3212	59	588	2980	6396	792	40	175
Difference, 30 per cent. and upwards	3667	6785	1408	80	172	1100	2574	179	15	86

Group of Counties in which the	1845–8. Above the Average Crime. Ratio which could neither Read nor Write.	Ratio which could Read and Write imperfectly.	Ratio which could Read and Write well.	Ratio of superior Education.	Instruction could not be ascertained	1845–8. Below the Average Crime. Ratio which could neither Read nor Write.	Ratio which could Read and Write imperfectly.	Ratio which could Read and Write well.	Ratio of superior Education.	Instruction could not be ascertained.
Difference of crime under 15 per cent.	34·0	58·5	7·1	·4	1·6	28·0	63·4	8·3	·3	1·2
Difference, 15 per cent. and under 30 per cent. . .	28·7	57·8	13·3	·2	2·4	29·2	62·7	7·7	·4	1·7
Difference, 30 per cent. and upwards	30·7	56·8	11·8	·7	1·4	28·5	66·5	4·6	·4	2·2
Total of these Districts	31·1	57·8	10·7	·4	1·9	28·5	63·6	7·5	·4	1·6
Ratio of England and Wales . .	30·4	59·5	9·7	·4	1·9					

Difference in favour of Education.

	1842–4. Of those who could neither Read nor Write.	Of those who could Read and Write imperfectly.	1845–8. Of those who could neither Read nor Write.	Of those who could Read and Write imperfectly.
Difference of Crime 15 per cent. . .	6·9	3·7	6·0	4·9
... ... 15 and under 30 .	2·2	7·7	— 0·5	4 9
... ... 30 and upwards .	3·1	5·2	2·2	9·7
Total	4·4	5·6	4·6	5·8

It is thus seen, that in each group in which there is an increased amount of crime, there is invariably an increased ratio of criminals who can neither read nor write. Taking the three parallel groups of counties in which those characterised by crime above the average are compared with those below the average crime, it will be seen that during the period 1842–4 the difference of criminals unable either to read or write is respectively 6·9, 2·2, and 3·1 per cent. greater in the counties having an excess of crime. On the other hand, the proportion who can read and write imperfectly shews a corresponding increase in favour of the groups with a low ratio of crime, being respectively 3·7, and 7·7, and 5·2 per cent. Similar results appear for the period 1845–8.

The following are the results for the total of those counties in which crime is above and below the average respectively for the seven years 1842–8:—

	Where Crime is above the average.	Where Crime is below the average.
The per-centage that can neither read nor write is	32·75	28·25
(Difference 4·5 per cent. in favour of Education.)		
The per-centage that can read and write imperfectly is	58·0	63·7
(Difference 5·7 per cent. in favour of Education.)		

Thus far it would seem that the evidence furnished of education, among even the criminals themselves, tends to shew that the small amount of instruction implied in the test here recognised—the simple distinction between the ability to read and write imperfectly, and inability either to read or write at all—has a most material influence in the development of crime; and, were the investigation carried no further, we should be forced to conclude, that since the most criminal districts shew a higher ratio of uninstructed persons among the criminals, and the less criminal districts a less proportion who are wholly destitute of the rudest elements of education, the immediate inference is, that even this small degree of instruction tends to the repression of crime.

Unless, however, this analysis were carried beyond its present limits, it may be objected, as in the former paper, that the peculiar results produced may be owing to some other cause than education. It may happen that differences of manufactures, of agriculture, of wealth, or of position in the social scale of society, existing in combination with the degree of crime already noticed, may be the real and active agent in producing the peculiar results attributed to education. In order, therefore, to see how far the facts of the case will support this view, a more refined analysis has been made of the various counties, placing them in groups, as in Table XVIII, in fact, placing them in groups so that they differ from each other only in their educational condition. It will thus be seen that the combinations now presented will exhibit all the methods by which the former analysis on pages 360–2 was brought to bear on the educational state of the whole community. And these have been further reduced to shew in precisely the same groups the degree of education among the criminal population. The results in detail of this particular portion of the inquiry will be found in the following Table XXVI.

[The following Abstract

Table XXVI.

Educational Condition of Criminals according to the classification of Table XVIII.

1842–4.

Group of Counties in section (*a*) Table XVIII.			Number and Ratio of Criminals in the Section of Inferior Degree of Education in the General Community.									
			Who could neither Read nor Write.		Who could Read and Write Imperfectly.		Who could Read and Write well.		Of Superior Education.		Instruction could not be ascertained.		Total.
			Actual Number.	Prop. per cent.	Actual Number.	Prop. per cent.	Actual Number.	Prop. per cent.	Actual Number.	Prop. per cent.	Actual Number.	Prop. per cent.	
Least Agricultural	Group 1 sect. (*a*)	Lancashire, Stafford, Monmouth, Chester, Warwick	5,849	35·0	9,422	56·3	1,340	8·0	121	·7	339	2·0	17,071
		Excluding Lancashire	2,629	31·5	4,798	57·5	822	9·9	85	1·0	153	1·8	8,487
Greatest	Group 2 sect. (*a*)	Bedford, Essex, Cambridge, Suffolk, Hunts	1,772	38·1	2,617	56·3	243	5·2	16	·3	70	1·5	4,718
Greatest Manufacturing	Group 3 sect. (*a*)	Stafford, Lancashire, Chester, Notts	5,127	35·1	8,328	57·1	1,033	7·1	90	·6	314	2·1	14,892
		Excluding Lancashire	1,907	30·8	3,704	60·0	515	8·3	54	·8	128	2·0	6,308
Least	Group 4 sect. (*a*)	Cambridge, Essex, Huntingdon, Rutland	1,035	38·0	1,559	57·2	117	4·3	12	·4	38	1·37	2,761
Manufacturing interest 33⅓ per cent. above the average	Group 5 sect. (*a*)	Stafford, Chester, Lancashire, Notts, Warwick	5,980	35·1	9,463	56·5	1,308	7·7	119	·7	331	1·9	17,381
		Excluding Lancashire	2,760	31·9	5,019	58·0	790	9·1	83	·9	145	1·7	8,797
Agricultural interest 50 per cent. above the average	Group 6 sect. (*a*)	Bedford, Suffolk, Cambridge, Essex, Huntingdon, Wilts	2,071	35·1	3,456	58·6	339	5·7	31	·5	84	1·4	5,981
Manufacturing and Agricultural interests nearly equal	Group 7 sect. (*a*)	Hereford, Bedford, Norfolk, Salop	1,703	39·6	2,343	54·5	244	5·7	9	·2	59	1·4	4,358
Greatest wealth	Group 8 sect. (*a*)	Devonshire, Gloucestershire	1,241	28·1	2,820	63·8	345	7·8	14	·3	95	2·1	4,515
Least wealth	Group 9 sect. (*a*)	Monmouth, Bedford, Hunts, Stafford	1,357	32·2	2,370	56·2	456	10·8	30	·7	125	2·9	4,338
		Group in which those signing with "Marks" exceed the average by 33⅓ per cent	2,797	36·9	4,344	57·2	416	5·5	31	·4	149	1·9	7,727

Table XXVI.—*(continued.)*

Group of Counties in section (*b*) Table XVIII.			Number and Ratio of Criminals in the Section of Higher Degree of Education in the General Community.										
			Who could neither Read nor Write.		Who could Read and Write imperfectly.		Who could Read and Write well.		Of Superior Education.		Instruction could not be ascertained.		Total.
			Actual Number.	Prop. per cent.	Actual Number.	Prop. per cent.	Actual Number.	Prop. per cent.	Actual Number.	Prop. per cent.	Actual number.	Prop. per cent.	
Least Agricultural	Group 1 sect. (*b*)	Durham, Surrey, Northumberland, Derby, Gloucester	2,014	28·3	4,553	63·9	538	7·5	16	·2	189	2·6	7,310
Greatest	Group 2 sect. (*b*)	Bucks, Lincoln, Hereford, Rutland, Berks, Wilts	1,413	29·5	3,065	64·1	277	5·8	28	·5	110	2·25	4,893
Greatest Manufacturing	Group 3 sect. (*b*)	Middlesex, Derby, Leicester, Warwick	3,398	24·9	8,066	59·1	2,120	15·5	61	·45	440	3·1	14,085
		Excluding Middlesex	1,422	31·1	2,661	58·3	450	9·9	32	·7	56	1·2	4,621
Least	Group 4 sect. (*b*)	Sussex, Lincoln, Hereford	949	30·6	1,983	64·0	158	5·1	7	·2	51	1·6	3,148
Manufacturing interest 33⅓ per cent. above the average	Group 5 sect. (*b*)	Middlesex, Surrey, Derby, Leicester	3,140	23·5	8,006	59·9	2,176	16·3	36	·3	456	3·3	13,814
		Excluding Middlesex	1,164	27·2	2,601	60·8	506	11·8	7	·16	72	1·7	4,350
Agricultural interest 50 per cent. above the average	Group 6 sect. (*b*)	Bucks, Sussex, Lincoln, Hereford, Rutland, Berks.	1,491	31·4	3,002	63·2	243	5·1	13	·3	100	2·0	4,849
Manufacturing and Agricultural interests nearly equal	Group 7 sect. (*b*)	Dorset, Southampton, Northampton	880	30·7	1,757	61·4	211	7·4	14	·5	81	2·7	2,943
Greatest wealth	Group 8 sect. (*b*)	Cumberland, Surrey, Westmoreland	672	26·8	1,455	58·1	372	14·9	6	·2	40	1·6	2,545
Least wealth	Group 9 sect. (*b*)	Bucks, Derby, Nottingham, Northampton	1,071	32·5	2,046	62·1	167	5·1	9	·3	81	2·4	3,374
	Group in which those signing with "Marks" are less than the average by 25 per cent.		1,826	29·2	3,726	59·6	678	10·8	23	·4	136	2·1	6,389

Table XXVII.

Educational Condition of Criminals during the Years 1845-8, *according to the classification of* Table XIX.—*Males.*

Group of Counties in Section (*a*) Table XIX.			Number and Ratio of Criminals in the Section of Inferior Degree of Education in the General Community.										
			Who could neither Read nor Write.		Who could Read and Write Imperfectly.		Who could Read and Write well.		Of Superior Education.		Instruction could not be ascertained.		Total.
			Actual Number.	Prop. per cent.	Actual Number.	Prop. per cent.	Actual Number.	Prop. per cent.	Actual Number.	Prop. per cent.	Actual Number.	Prop. per cent.	
Least Agricultural	Group 1 sect. (*a*)	Lancashire, Stafford, Monmouth, Chester, Warwick	6,175	32·39	11,201	58·77	1,563	8·21	120	0·63	342	1·76	19,401
		Excluding Lancashire	2,983	31·83	5,364	57·25	950	10·14	73	0·78	181	1·90	9,551
Greatest	Group 2 sect. (*a*)	Bedford, Essex, Cambridge, Suffolk, Hunts	1,962	35·80	3,151	57·50	341	6·22	26	0·48	87	1·56	5,567
Greatest Manufacturing	Group 3 sect. (*a*)	Stafford, Lancashire, Chester, Notts	5,316	32·71	9,653	59·41	1,188	7·31	92	0·57	315	1·90	16,564
		Excluding Lancashire	2,124	32·38	3,816	58·16	575	8·77	45	0·69	154	2·29	6,714
Least	Group 4 sect. (*a*)	Cambridge, Essex, Huntingdon, Rutland	1,227	36·10	1,966	57·84	189	5·56	17	0·50	51	1·48	3,450
Manufacturing interest 33⅓ per cent. above the average	Group 5 sect. (*a*)	Stafford, Chester, Lancashire, Notts, Warwick	6,307	32·58	11,354	58·65	1,576	8·14	122	0·63	343	1·74	19,702
		Excluding Lancashire	3,115	32·21	5,517	57·05	963	9·96	75	0·78	182	1·85	9,852
Agricultural interest 50 per cent. above the average	Group 6 sect. (*a*)	Bedford, Suffolk, Cambridge, Essex, Hunts, Wilts	2,313	33·10	4,171	59·68	474	6·78	31	0·44	103	1·45	7,092
Manufacturing and Agricultural interest nearly equal	Group 7 sect. (*a*)	Hereford, Bedford, Norfolk, Salop	1,819	40·46	2,308	51·33	368	8·19	1	0·02	56	1·23	4,552
Greatest Wealth	Group 8 sect. (*a*)	Devonshire, Gloucestershire	1,648	29·42	3,061	54·65	861	15·38	31	0·55	100	1·75	5,701
Least Wealth	Group 9 sect. (*a*)	Monmouth, Bedford, Hunts, Stafford	1,436	31·48	2,668	58·47	436	9·55	23	0·50	125	2·67	4,688
		Group in which those signing with "Marks" exceed the average by 33⅓ per cent.	3,226	35·37	5,282	57·92	571	6·26	41	0·45	168	1·81	9,288

Table XXVII.—Males.—*(continued.)*

Group of Counties in Section (*b*) Table XIX.		Number and Ratio of Criminals in the Section of Higher Degree of Education in the General Community.										
		Who could neither Read nor Write.		Who could Read and Write imperfectly.		Who could Read and Write well.		Of Superior Education.		Instruction could not be ascertained.		Total.
		Actual Number.	Prop. per cent.	Actual Number.	Prop. per cent.	Actual Number.	Prop. per cent.	Actual Number.	Prop. per cent.	Actual Number.	Prop. per cent.	
Least Agricultural	Group 1 sect. (*b*) Durham, Surrey, Northumberland, Derby, Gloucester	2,283	26·10	5,304	60·64	1,123	12·84	37	0·42	161	1·81	8,908
Greatest	Group 2 sect. (*b*) Bucks, Lincoln, Hereford, Rutland, Berks, Wilts	1,846	31·42	3,665	62·38	346	5·89	18	0·31	71	1·19	5,946
Greatest Manufacturing	Group 3 sect. (*b*) Middlesex, Derby, Leicester, Warwick	4,816	24·99	11,459	59·47	2,945	15·28	49	0·26	369	1·88	19,638
	Excluding Middlesex	1,466	28·86	2,971	58·48	611	12·03	32	0·63	65	1·26	5,145
Least	Group 4 sect. (*b*) Sussex, Lincoln, Hereford	1,201	32·28	2,323	62·43	190	5·10	7	0·19	35	0·93	3,756
Manufacturing interest, 33⅓ per cent. above the average	Group 5 sect. (*b*) Middlesex, Surrey, Derby, Leicester	4,674	23·83	11,898	60·65	3,016	15·38	28	0·14	386	1·93	20,002
	Excluding Middlesex	1,324	24·40	3,410	62·83	682	12·57	11	0·20	82	1·49	5,509
Agricultural interest 50 per cent. above the average.	Group 6 sect. (*b*) Bucks, Sussex, Lincoln, Hereford, Rutland, Berks	1,949	32·80	3,692	62·14	287	4·83	14	0·23	70	1·16	6,012
Manufacturing and Agricultural interest nearly equal	Group 7 sect. (*b*) Dorset, Southampton, Northampton	1,229	30·82	2,479	62·16	255	6·39	25	0·63	72	1·77	4,060
Greatest wealth	Group 8 sect. (*b*) Cumberland, Surrey, Westmoreland	971	24·34	2,500	62·69	506	12·69	11	0·28	60	1·48	4,048
Least wealth	Group 9 sect. (*b*) Bucks, Derby, Notts, Northampton	1,178	30·33	2,496	64·26	198	5·10	12	0·31	78	1·97	3,962
	Groups in which those signing with "Marks" are less than the average by 25 per cent.	2,539	28·54	5,449	61·25	880	9·89	29	0·32	172	1·90	9,069

The following Abstract has been made of Table XXVI.:—

Groups of Counties.	Number of Criminals during the years 1842—4 in the Sections of									
	Inferior Degree of Education in the General Community (*a*).					Higher Degree of Education in the General Community (*b*).				
	Who could neither Read nor Write.	Who could Read and Write imperfectly.	Who could Read and Write well.	Of Superior Education.	Instruction could not be ascertained.	Who could neither Read nor Write.	Who could Read and Write imperfectly.	Who could Read and Write well.	Of Superior Education.	Instruction could not be ascertained.
Least Agricultural	2,629	4,798	822	85	153	2,014	4,553	538	16	189
Greatest	1,772	2,617	243	16	70	1,413	3,065	277	28	110
Greatest Manufacturing . .	1,907	3,704	515	54	128	1,422	2,661	450	32	56
Least	1,035	1,559	117	12	38	949	1,983	158	7	51
Manufacturing interest 33⅓ per cent. above the average	2,760	5,019	790	83	145	1,164	2,601	506	7	72
Agricultural interest 50 per cent. above the average .	2,071	3,456	339	31	84	1,491	3,002	243	13	100
Manufacturing and Agricultural interests nearly equal	1,703	2,343	244	9	59	880	1,757	211	14	81
Greatest Wealth	1,241	2,820	345	14	95	672	1,455	372	6	40
Least Wealth	1,357	2,370	456	30	125	1,071	2,046	167	9	81
Total	16,475	28,686	3,871	334	897	11,076	23,123	2,922	132	780
"Marks," 33⅓ per cent. above the average, and 25 per cent. below the average .	2,797	4,334	416	31	149	1,826	3,726	678	23	136

Groups of Counties.	Ratio of Criminals during the years 1842—4 in the Sections of									
	Inferior Degree of Education in the General Community (*a*).					Higher Degree of Education in the General Community (*b*)				
	Who could neither Read nor Write.	Who could Read and Write imperfectly.	Who could Read and Write well.	Of superior Education.	Instruction could not be ascertained.	Who could neither Read nor Write.	Who could Read and Write imperfectly.	Who could Read and Write well.	Of Superior Education.	Instruction could not be ascertained.
Least Agricultural	31·5	57·5	9·9	1·0	1·8	28·3	63·9	7·5	·2	2·6
Greatest	38·1	56·3	5·2	·3	1·5	29·5	64·1	5·8	·5	2·3
Greatest Manufacturing . .	30·8	60·0	8·3	·8	2·0	31·1	58·3	9·9	·7	1·2
Least	38·0	57·2	4·3	·4	1·4	30·6	64·0	5·1	·2	1·6
Manufacturing interest 33⅓ per cent. above the average	31·9	58·0	9·1	·9	1·7	27·2	60·8	11·8	·2	1·7
Agricultural interest 50 per cent. above the average .	35·1	58·6	5·7	·5	1·4	31·4	63·2	5·1	·3	2·0
Manufacturing and Agricultural interests nearly equal	39·6	54·5	5·7	·2	1·4	30·7	61·4	7·4	·5	2·7
Greatest Wealth	28·1	63·8	7·8	·3	2·1	26·8	58·1	14·9	·2	1·6
Least Wealth	32·2	56·2	10·8	·7	2·9	32·5	62·1	5·1	·3	2·4
Total	32·8	57·1	7·7	·6	1·8	29·1	60·8	7·7	·3	2·1
"Marks," 33⅓ per cent. above the average, and 25 per cent. below the average .	36·9	57·2	5·5	·4	1·9	29 2	59·6	10·8	·4	2·1

Abstract taken from TABLE XXVII.

Group of Counties.	Number of Criminals during the Years 1845-8 in the Sections of									
	Inferior Degree of Education in the General Community (*a*).					Higher Degree of Education in the General Community (*b*).				
	Who could neither Read nor Write.	Who could Read and Write imperfectly.	Who could Read and Write well.	Of Superior Education.	Instruction could not be ascertained.	Who could neither Read nor Write.	Who could Read and Write imperfectly.	Who could Read and Write well.	Of Superior Education.	Instruction could not be ascertained.
Least Agricultural . . .	2,983	5,364	950	73	181	2,283	5,304	1,123	37	161
Greatest	1,962	3,151	341	26	87	1,846	3,665	346	18	71
Greatest Manufacturing . .	2,124	3,816	575	45	154	1,466	2,971	611	32	65
Least	1,227	1,966	189	17	51	1,201	2,323	190	7	35
Manufacturing interest 33⅓ per cent. above the average	3,115	5,517	963	75	182	1,324	3,410	682	11	82
Agricultural interest 50 per cent. above the average .	2,313	4,171	474	31	103	1,499	3,692	287	14	70
Manufacturing and Agricultural interests nearly equal	1,819	2,308	368	1	56	1,229	2,479	255	25	72
Greatest Wealth	1,648	3,061	861	31	100	971	2,500	506	12	60
Least Wealth	1,436	2,668	436	23	125	1,178	2,496	198	12	78
Total	18,627	32,022	5,157	322	1,039	13,447	28,840	4,198	167	694
"Marks" 33⅓ per cent. above the average, and 25 per cent. below the average .	3,226	5,282	571	41	168	2,539	5,449	880	29	172

Group of Counties.	Ratio of Criminals during the Years 1845-8 in the Sections of									
	Inferior Degree of Education in the General Community (*a*).					Higher Degree of Education in the General Community (*b*).				
	Who could neither Read nor Write.	Who could Read and Write imperfectly.	Who could Read and Write well.	Of Superior Education.	Instruction could not be ascertained.	Who could neither Read nor Write.	Who could Read and Write imperfectly.	Who could Read and Write well.	Of Superior Education.	Instruction could not be ascertained.
Least Agricultural . . .	31·8	57·3	10·1	·8	1·9	26·1	60·6	12·9	·4	1·8
Greatest	35·8	57·5	6·2	·5	1·6	31·4	62·4	5·9	·3	1·2
Greatest Manufacturing . .	32·4	58·2	8·7	·7	2·3	28·9	58·5	12·0	·6	1·3
Least	36·1	57·8	5·6	·5	1·5	32·3	62·4	5·1	·2	·9
Manufacturing interest 33⅓ per cent. above the average	32·2	57·0	10·0	·8	1·9	24·4	62·8	12·6	·2	1·5
Agricultural interest 50 per cent. above the average .	33·1	59·7	6·8	·4	1·5	32·8	62·2	4·8	·2	1·2
Manufacturing and Agricultural interests nearly equal	40·5	51·3	8·2	·0	1·2	30·8	62·2	6·4	·6	1·8
Greatest Wealth	29·4	54·6	13·4	·6	1·8	24·3	62·7	12·7	·3	1·5
Least Wealth	31·5	58·5	9·5	·5	2·7	30·3	64·3	5·1	·3	2·0
Total	33·2	57·0	9·2	·6	1·8	28·8	61·8	9·0	·4	1·4
"Marks" 33⅓ per cent. above the average, and 25 per cent. below the average .	35·4	57·9	6·3	·4	1·8	28·5	61·3	9·9	·3	1·9

The following results are deduced from the figures given in the second sections of the Abstracts in this and the preceding page.

Difference in favour of Education during 1842-8.	Of those who could neither Read nor Write.	Of those who could Read and Write imperfectly	Of those who could Read and Write well.
Group of Least Agricultural	4·4	4·8	·2
... Greatest ...	6·5	6·3	— 1·1
... Greatest Manufacturing	1·6	— ·7	2·4
... Least ...	5·6	5·7	·1
... Manufacturing interest 33⅓ per cent. above the average	6·2	4·3	2·7
... Agricultural interest 50 per cent. above the average	2·0	3·5	— 1·3
... Manufacturing and Agricultural interests nearly equal	9·3	8·9	— ·1
... Greatest Wealth	3·2	1·2	3·2
... Least Wealth	·4	5·8	— 5·1
Total	4·0	4·2	— ·1
"Marks" 33⅓ per cent. above the average, and 25 per cent. below the average	7·3	2·9	4·4

A remarkable feature presents itself in these Abstracts. The form in which they are arranged shews not only districts in which there is an inferior degree of education in the general community, accompanied with an increased amount of criminals, but also at the same time an increased ratio of uninstructed criminals in the same districts, compared with that in the higher educated districts, and a reduced rate of crime. The agreement, therefore, of those two very different educational tests, and their general assimilation throughout, may be safely regarded as sufficient indications of the relative amount of actual education in the respective districts; and, consequently, should any uniform or constant increase or decrease of crime be found to fluctuate with the amount of education thus determined, it will furnish the argument for or against the influence of education on the development of crime.

From the preceding Abstract however, it appears that in all the eleven combinations represented there is a marked difference in favour of education; or, in other words, there is constantly an increased ratio of uninstructed criminals where crime is above the average, and also a reduced ratio of uninstructed criminals where crime is at a lower ebb. In the greatest agricultural district it will be seen that in the group in which crime is least, there is 6·5 per cent. less of uninstructed criminals than in the other group of the districts where a higher ratio of crime prevails. Again, take the districts in which the manufacturing and agricultural interests are nearly equal, and it will be found that in the group of least crime, there is 9·3 per cent. less of uninstructed criminals than in the parallel group of higher crime. Also, take the groups representing those districts of the country in which persons who marry signing the register with their marks, exceed the average of the country by 33⅓ per cent., and likewise in which those so signing are less than the average by 25 per cent., and it will be found that the former shews an increase of 43·9 per cent. during 1842–4, and of 35·6 per cent. during 1845–8 of crime over the latter district, and at the same time an increase of 7·3 per cent. of uninstructed criminals throughout the whole period. In this instance, as well as in all the others referred to in the same Abstract, we may observe the following most important combination repre-

[sented:—the districts

Table XXVIII.

Shewing the relative degree of Instruction among Criminals in each class of Offences.—Males and Females.

1836–7–8–9.

Division of Offences.		Neither Read nor Write.		Read and Write imperfectly.		Read and Write well.		Superior Instruction.		Instruction could not be ascertained.		Total Number of Offenders.	
		Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
Div. (1)	1836.	419	61	844	101	302	20	48	...	146	15	1759	197
	1837.	422	59	709	95	252	6	20	1	135	20	1538	181
	1838.	454	59	776	97	276	16	23	1	143	14	1672	187
	1839.	438	50	909	108	283	24	21	...	155	21	1806	203
Total		1733	229	3238	401	1113	66	112	2	579	70	6775	768
Ratio per cent.		27·97	32·81	52·26	57·45	17·96	9·45	1·81	·29	...	...	...	...
Div. (2)	1836.	380	29	686	40	150	2	8	...	14	1	1238	72
	1837.	472	33	732	35	117	3	2	...	6	...	1329	71
	1838.	510	41	809	33	129	6	1	...	9	...	1458	80
	1839.	455	41	767	41	112	2	1	...	13	...	1348	84
Total		1817	144	2994	149	508	13	12	...	42	1	5373	307
Ratio per cent.		34·08	47·06	56·16	48·69	9·53	4·25	·23	...	...	...	...	...
Div. (3)	1836.	4460	1257	6789	1767	1386	164	92	14	195	43	12922	3245
	1837.	5420	1556	8076	1897	1506	146	59	2	170	52	15231	3653
	1838.	5102	1420	7882	2040	1469	159	34	4	141	27	14628	3650
	1839.	5206	1526	8105	2298	1594	211	30	4	217	52	15152	4091
Total		20188	5759	30852	8002	5955	680	215	24	723	174	57933	14639
Ratio per cent.		35·29	39·81	53·93	55·32	10·41	4·70	·37	·17	...	...	...	...
Div. (4)	1836.	47	6	76	6	23	...	2	...	8	...	156	12
	1837.	34	4	45	8	12	...	2	...	9	...	102	12
	1838.	23	2	47	8	7	...	1	...	1	...	79	10
	1839.	40	2	35	8	18	...	...	...	2	...	95	10
Total		144	14	203	30	60	...	5	...	20	...	432	44
Ratio per cent.		34·95	31·82	49·27	68·18	14·56	...	1·22	...	...	...	...	...
Div. (5)	1836.	65	38	162	30	47	5	11	...	...	1	285	74
	1837.	94	67	185	48	51	4	7	...	...	...	337	119
	1838.	87	44	205	66	87	5	6	...	2	1	387	116
	1839.	80	47	170	50	71	10	6	...	2	...	329	107
Total		326	196	722	194	256	24	30	...	4	2	1338	416
Ratio per cent.		24·44	47·34	54·12	46·86	19·19	5·80	2·25	...	...	...	...	...
Div. (6)	1836.	227	44	411	71	108	8	15	1	127	12	888	136
	1837.	242	61	400	68	119	18	8	...	101	22	870	169
	1838.	166	35	289	82	83	20	9	...	134	9	681	146
	1839.	268	43	537	43	123	14	16	...	157	17	1101	117
Total		903	183	1637	264	433	60	48	1	519	60	3540	568
Ratio per cent.		29·89	36·02	54·19	51·97	14·33	11·81	1·59	·20	...	...	...	...
Grand Total		25111	6525	39646	9040	8325	843	422	27	1887	307	75391	16742
Ratio per cent.		34·16	39·70	53·94	55·00	11·33	5·13	·57	·17	...	...	...	...

sented:—the districts of the country in which the general population is worst educated, the districts in which the greatest amount of crime prevails, and the districts in which there is the highest proportion of uninstructed criminals, are found constantly assimilating; while, on the other side of the question, we have to view those districts of the country which are best educated, the least criminal, and in which a less proportion is found of uninstructed criminals, identified. Since it thus appears, by adopting either of the available tests of education, that crime and ignorance are constant companions, prevention being better than cure, it becomes an important, if not an imperative duty, to reduce the amount of crime by the simple means of a good general education. As already stated, education in its higher sense must of necessity disseverate itself from crime, and this eminent degree of education will perhaps be long impossible of attainment to the whole population of any country; but there seem to be no insuperable difficulties in the way of imparting to the bulk of a community something above the mere elements of reading and writing at least; and in this limited sense it is evident there is to be found a powerful check on crime, and no doubt the most efficient means of subduing the evil propensities of the people.

In the preceding Table XXVIII, an analysis will be found of the educational condition of criminals during the years 1836, 7, 8, 9, for each of the six classes of crime given in the Home Office Returns.

1. Offences against the person.
2. Offences against property committed with violence.
3. Offences against property committed without violence.
4. Malicious offences against property.
5. Forgery and other offences against the currency.
6. Other offences.

The facts were thrown into this form with a view to determine, if possible, whether there was any, and what difference in the education of criminals committed for various classes of offences. It will be seen from the following abstract of this Table, that the proportion of criminals who could neither read nor write was highest in the class (3) for offences against property committed without violence, and least in the class (5) of forgery and other offences against the currency; being 35·29 in the former, and 24·44 in the latter, who could neither read nor write. Again, the ratio of those who could *read and write well* was least in the class (2) of offences against property committed with violence, being 9·53 per cent., and highest in the class (5) of forgery and other offences against the currency; and those of superior instruction were also lowest and highest in the same two classes, being only ·23 in the former class, and 2·25 in the latter. The results for the whole of these classes combined during the same years, were of those who can—

Neither read nor write	34·16 per cent.
Read and write imperfectly	53·94 ...
Read and write well	11·33 ...
Superior instruction	0·57 ...

MALES.

Degree of Instruction.	Division (1)	Division (2)	Division (3)	Division (4)	Division (5)	Division (6)	Total.
Number who could neither read nor write	1733	1817	20188	144	236	903	25111
Number who could read and write imperfectly	3238	2991	30852	203	722	1637	39646
Number who could read and write well	1113	508	5955	60	256	433	8325
Number possessed of superior instruction	112	12	215	5	30	48	422
Number whose instruction could not be ascertained	579	42	723	20	4	519	1887
Total number of offenders in each class	6775	5373	57933	432	1338	3540	75391

MALES.

Degree of Instruction.	Division (1)	Division (2)	Division (3)	Division (4)	Division (5)	Division (6)	Total.
Ratio who could neither read nor write	27·97	34·08	35·29	34·95	24·44	29·89	34·16
Ratio who could read and write imperfectly	52·26	56·16	53·93	49·27	54·12	54·19	53·94
Ratio who could read and write well	17·96	9·53	10·41	14·56	19·19	14·33	11·33
Ratio of superior instruction	1·81	·23	·37	1·22	2·25	1·59	·57

The following Abstract will shew the results for the same four years for the female sex :—

FEMALES.

Degree of Instruction.	Division (1)	Division (2)	Division (3)	Division (4)	Division (5)	Division (6)	Total.
Number who could neither read nor write	229	144	5759	14	196	183	6525
Number who could read and write imperfectly	401	149	8002	30	194	264	9040
Number who could read and write well	66	13	680	...	24	60	843
Number possessed of superior instruction	2	...	24	...	...	1	27
Number whose instruction could not be ascertained	70	1	174	...	2	60	307
Total number of offenders in each class	768	307	14639	44	416	568	16742

FEMALES.

Degree of Instruction.	Division (1)	Division (2)	Division (3)	Division (4)	Division (5)	Division (6)	Total.
Ratio who could neither read nor write	32·81	47·06	39·81	31·82	47·34	36·02	39·70
... could read & write imperfectly	57·45	48·69	55·32	68·18	46·86	51·97	55·00
... could read and write well . .	9·46	4·25	4·70	...	5·80	11·81	5·13
... of superior instruction	·29	...	·17	...	...	·20	·17

The ratio of those who could neither read nor write is thus lowest for class (4), and highest for class (5), being 31·82 per cent. in the former, and 47·34 in the latter; but during those four years it appears that in the class (4), for malicious offences against property, there was not a single one in the whole of England and Wales returned as being able to read and write well, or as possessing superior instruction; so also in the class (2), of offences against property committed with violence, and in the class (5), of forgery and other offences against the currency, not a single instance occurred in the whole kingdom during those years, of a person being committed possessing superior instruction. Amongst females, class (1), including the offences against the person, seems to be the most remarkable, as the ratio of those who could

Neither read nor write, was . . . . . 32·81 per cent.
Read and write imperfectly . . . . . 57·45 ...
Read and write well . . . . . 9·46 ...

The following will exhibit the relative degrees of education in the aggregate of the criminal classes of both sexes during the years 1836, 1837, 1838, and 1839.

Degree of Instruction.	Males.	Females.	Difference.
Ratio who can neither read nor write . .	34·16	39·70	—3·54
... can read and write imperfectly	53·94	55·00	—1·06
... can read and write well . .	11·33	5·13	+ 6·20
... of superior instruction . . .	0·57	0·17	+ 0·50

It will thus be seen, that although a higher ratio of females were able to read and write imperfectly, still a greater proportion of females could not read or write at all; and, while 5·13 per cent. only of females could read and write well, there was 11·33 per cent. of the males who were equally instructed.

It may appear anomalous, while education is held to have so powerful an influence in repressing crime, and the female criminals are less educated than the males, that the ratio of crime is not also greater in the female sex. This argument, however, woul be based on a very narrow and limited view of the question, for the application of the mere test of education itself will not always be sufficient to determine the relative amount of crime. Before applying this or any other test, it is necessary, in order to see its full influence or effect, that the two districts or groups compared should be similar in all other conditions, social and otherwise, and simply differing in regard to the one element, the

force of which it was proposed to measure. Among the various elements influencing crime, sex has already been shewn to be a most important one, as on the aggregate of ages the tendency to crime in the male sex was to that in the female sex, as ·2978 is to ·0633—in fact, nearly as five to one. It is not enough to take into view simply the mental and moral conditions of the mind itself, but those conditions in relation to external circumstances and the state of society; and whatever may be the state of education and the natural feelings and passions peculiar to the female mind, sufficient has been shewn in the former paper, to prove that the difference in her social position in this country exposes her to less temptations to crime. In like manner does the same evidence prove, that while the state of education remains unaltered or constant in the country, crime may be fluctuating or gradually increasing or decreasing under the influence of the altered external circumstances with which man is surrounded; so also may the education of the people increase and become more general—as appears to be the case from the facts disclosed by the registers of marriage, which shew that the proportion of males signing the register with marks has gradually changed from 33·7 per cent. in 1839, to 31·2 per cent. in 1848; while, during the same years, the proportion of male criminals that can neither read nor write has decreased from 33·53 per cent. to 31·9 per cent.; and all this time crime may have likewise increased, but still it will remain a fact, that education counteracts the tendency, so long as the criminal returns shew that, everything else being the same, crime is at a minimum where education is at a maximum, and that where education is least, crime is highest. Changes in the political, manufacturing, and commercial aspects of the country—alterations in the police and criminal laws—have all their influence; and although for a period, or even a long series of years, crime may be on the increase, education may still be importantly concerned in the development or repression of crime.

Nothing has yet been said on the nature and extent of the various descriptions of crimes and offences. In the early part of this communication it was shewn, that in investigating the question of crime in its aggregate character, no satisfactory or true results could possibly be obtained, unless the element of age entered into the inquiry. If it be, then, so essential an element in discussing the question of crime in its general aspect, it must be evident that in its specific form there is still less chance of success, when without the means of employing the element of age. It is, therefore, to be lamented, that although in the Home Office Returns the number of criminals guilty of particular offences is given, no mention is made of their ages in connection with specific forms of crime. This defect might easily be remedied. Local and provincial police-courts and districts have seen the value of such information; and it is to be regretted that the authorities at head-quarters should still be indifferent to the great advantages that must result from affording inquirers into criminal statistics a means of introducing so important an element into their investigations.

[It was not known

Table XXIX.

Shewing the Age and Sex of the total number of Persons Committed for Trial or Bailed in 1834, 5, 6, 7, 8, *and* 9. *Males and Females.*

Division of Offences.		Aged 12 years and under.		Aged 16 years and above 12.		Aged 21 years and above 16.		Aged 30 years and above 21.		Aged 40 years and above 30.		Aged 50 years and above 40.		Aged 60 years and above 50.		Aged above 60 years.		Age could not be ascertained.		Total Number of Offenders.	
		Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
Division (1)	1834	5	3	52	3	466	28	804	82	346	39	175	23	80	10	43	2	253	41	2224	231
	1835	3	1	57	8	339	41	670	65	352	55	149	26	73	12	24	4	123	14	1790	226
	1836	4	...	59	7	364	25	669	64	305	44	136	30	71	6	31	6	120	15	1759	197
	1837	2	...	34	3	301	28	610	76	281	43	110	17	63	4	25	3	112	17	1538	181
	1838	5	...	46	1	339	36	615	67	301	37	141	15	57	5	36	1	132	15	1672	187
	1839	7	...	42	4	411	39	677	80	313	36	134	17	55	5	36	2	131	20	1806	203
Total		26	4	290	26	2220	197	4045	434	1898	254	845	128	399	42	195	18	871	122	10789	1225
Corrected* Total .		28	...	314	...	2415	...	4401	...	2065	...	920	...	434	...	212	...	...	...	...	...
Division (2)	1834	13	3	106	2	573	30	527	30	113	4	38	...	10	2	4	...	5	...	1389	71
	1835	8	...	75	7	545	24	477	26	124	8	27	3	17	...	7	...	6	...	1286	68
	1836	16	...	71	2	478	28	482	23	124	12	40	3	8	2	5	2	14	...	1238	72
	1837	8	3	107	3	529	28	502	22	134	7	29	5	11	2	3	1	6	...	1329	71
	1838	16	...	145	12	629	30	485	19	122	13	39	4	8	2	8	...	6	...	1458	80
	1839	16	2	103	5	499	34	516	29	139	6	40	5	18	2	11	1	6	...	1348	84
Total		77	8	607	31	3253	174	2989	149	756	50	213	20	72	10	38	4	43	...	8048	446
Corrected Total .		78	...	610	...	3270	...	3005	...	760	...	214	...	73	...	38	...	...	...	...	...
Division (3)	1834	310	55	1699	288	4203	775	4019	930	1822	505	870	245	392	129	179	48	114	24	13608	2999
	1835	277	50	1542	277	4009	771	3737	934	1634	433	764	272	373	124	140	45	78	18	12554	2924
	1836	312	51	1570	296	3970	884	3833	983	1735	515	781	297	399	147	181	44	141	28	12922	3245
	1837	289	51	1777	317	4617	1034	4587	1137	2108	560	985	302	477	153	236	69	155	30	15231	3653
	1838	292	49	1709	338	4350	1045	4449	1105	2110	549	949	342	433	128	223	71	113	23	14628	3650
	1839	335	56	1878	385	4354	1144	4450	1228	2229	630	1024	359	480	168	222	74	180	47	15152	4091
Total		1815	312	10175	1901	25503	5653	25075	6317	11638	3192	5373	1817	2554	849	1181	351	781	170	84095	20562
Corrected Total .		1832	...	10271	...	25742	...	25310	...	11747	...	5423	...	2578	...	1192	...	...	...	...	...

* The Corrected Total represents, in every case, the number of Male Criminals at each Term, provided the age of every Criminal had been ascertained and is obtained by the formula given on page 2.

Division of Offences.		Aged 12 years and under.		Aged 16 years and above 12.		Aged 21 years and above 16.		Aged 30 years and above 21.		Aged 40 years and above 30.		Aged 50 years and above 40.		Aged 60 years and above 50.		Aged above 60 years.		Age could not be ascertained.		Total Number of Offenders.	
		Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
Division (4)	1834	3	...	5	4	36	2	56	2	21	...	15	2	8	1	3	1	3	...	150	12
	1835	4	..	5	3	38	1	51	7	21	1	10	4	3	...	7	...	1	...	140	16
	1836	2	...	11	6	33	1	52	2	25	...	15	1	8	1	2	1	8	...	156	12
	1837	1	...	9	3	20	5	40	1	13	2	10	1	4	...	...	...	5	...	102	12
	1838	1	...	8	1	18	4	26	2	7	3	13	...	4	...	1	...	1	...	79	10
	1839	3	1	3	2	31	1	23	4	16	1	8	1	6	...	1	...	1	...	95	10
Total		14	1	41	19	179	14	248	18	103	7	71	9	33	2	14	2	19	...	722	72
Corrected Total .		14	...	42	...	184	...	255	...	105	...	73	...	34	...	15	...	...	...	...	...
Division (5)	1834	2	2	11	7	72	33	116	37	52	22	30	15	12	7	5	5	1	2	301	130
	1835	1	...	7	8	79	30	109	27	50	7	20	6	6	7	6	4	1	...	279	89
	1836	...	...	2	3	96	17	109	25	48	12	24	6	2	8	4	2	...	1	285	74
	1837	1	1	16	8	89	16	123	48	67	20	26	12	9	7	6	7	...	...	337	119
	1838	3	...	9	4	102	30	136	38	73	27	35	9	18	5	10	3	1	...	387	116
	1839	...	2	16	2	80	25	127	36	56	20	32	13	7	6	9	3	2	...	329	107
Total		7	5	61	32	518	151	720	211	346	108	167	61	54	40	40	24	5	3	1918	635
Corrected Total .		7	...	62	...	519	...	721	...	347	...	168	...	54	...	40	...	...	...	...	...
Division (6)	1834	4	...	26	1	248	7	420	46	183	39	93	19	33	2	13	...	188	14	1208	128
	1835	2	...	21	...	247	23	480	34	190	29	72	16	42	16	28	4	144	11	1226	133
	1836	1	...	9	1	182	14	313	37	162	45	74	12	34	14	12	3	101	10	888	136
	1837	2	...	19	...	218	17	310	48	155	49	51	23	23	11	14	1	78	20	870	169
	1838	...	...	16	2	124	20	224	39	120	44	49	26	25	6	11	2	112	7	681	146
	1839	2	...	20	4	224	16	391	44	182	23	62	7	46	4	19	1	155	18	1101	117
Total		11	...	111	8	1243	97	2138	248	992	229	401	103	203	53	97	11	778	80	5974	829
Corrected Total .		13	...	128	...	1429	...	2458	...	1140	...	461	...	233	...	112	...	...	...	...	...
Totals . .	1834	337	63	1899	305	5598	875	5942	1127	2537	609	1221	304	535	151	247	56	564	81	18880	3571
	1835	295	51	1707	303	5257	890	5524	1093	2371	533	1042	327	514	159	212	57	353	43	17275	3456
	1836	335	51	1722	315	5123	969	5458	1134	2399	628	1070	349	522	178	235	58	384	54	17248	3736
	1837	303	55	1962	334	5774	1128	6172	1322	2758	681	1211	360	587	177	284	81	356	67	19407	4205
	1838	317	49	1933	358	5562	1165	5935	1280	2733	673	1226	396	545	146	289	77	365	45	18905	4189
	1839	363	61	2062	402	5602	1259	6184	1421	2935	716	1300	402	612	185	298	81	475	85	19831	4612
Grand Total . .		1950	330	11285	2017	32916	6286	35215	7377	15733	3840	7070	2138	3315	996	1565	410	2497	375	111546	23769
Cor. Grand Total .		1995	...	11543	...	33670	...	36021	...	16093	...	7232	...	3391	...	1601	...	...	...	...	...

TABLE XXX.—*Criminal Offenders in England and Wales during the years* 1834, 5, 6, 7, 8, *and* 9, *in each Class of Offences, with the Ratio of Crime to the Population at the various Terms of Life, calculated to the corrected Population for the respective periods.*—MALES.

Ages.	Population in the Years 1834, 5, 6, 7, 8, and 9.		Criminals for those Years in each class of Offences.													
			Offences against the Person. (1)		Offences against Property with violence. (2)		Offences against Property without violence. (3)		Malicious Offences against Property. (4)		Forgery and Offences against the Currency. (5)		Other Offences, not included in the above classes. (6)		Total of all classes.	
			No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Under 5	1834	993160														
	1835	1000810														
	1836	1008538														
	1837	1016316														
	1838	1024154														
	1839	1032053														
			6075040													
5 to 10	1834	891641														
	1835	900163														
	1836	908767														
	1837	917453														
	1838	926222														
	1839	935075														
			5479321													
10 to 15.	1834	806642														
	1835	816795														
	1836	827077														
	1837	837488														
	1838	848030														
	1839	858704														
			4994736													
12 years and under	1834	2368786														
	1835	2391059														
	1836	2413551														
	1837	2436262														
	1838	2459194														
	1839	2482350														
			14551202	28	·00019	78	·00053	1832	·01259	14	·00009	7	·00004	13	·00008	1995	·01371
16 years and above 12	1834	624731														
	1835	632953														
	1836	641285														
	1837	649727														
	1838	658280														
	1839	666946														
			3873922	314	·00811	610	·01574	10271	·26513	42	·00108	62	·00160	128	·00330	11543	·29797
21 years and above 16	1834	687044														
	1835	698331														
	1836	709808														
	1837	721479														
	1838	733348														
	1839	745417														
			4295427	2415	·05622	3270	·07613	25742	·59929	184	·00428	519	·01208	1429	·03326	33670	·78386
30 years and above 21	1834	1020024														
	1835	1042765														
	1836	1066014														
	1837	1089781														
	1838	1114076														
	1839	1138915														
			6471575	4401	·06800	3005	·04643	25310	·39109	255	·00394	721	·01114	2458	·03798	36021	·55660
40 years and above 30	1834	871464														
	1835	888800														
	1836	906480														
	1837	924512														
	1838	942902														
	1839	961660														
			5495818	2065	·03757	760	·01383	11747	·21374	102	·00191	347	·00631	1140	·02074	16093	·29282
50 years and above 40	1834	671533														
	1835	682123														
	1836	692879														
	1837	703805														
	1838	714904														
	1839	726177														
			4191421	920	·02195	214	·00510	5423	·12938	73	·00174	168	·00401	461	·01099	7232	·17254
60 years and above 50	1834	455946														
	1835	461580														
	1836	467284														
	1837	473058														
	1838	478904														
	1839	484821														
			2821593	434	·01538	73	·00258	2578	·09136	34	·00123	54	·00191	233	·00825	3391	·12018
Above 60 years	1834	494796														
	1835	500187														
	1836	505636														
	1837	511145														
	1838	516714														
	1839	522344														
			3050822	212	·00695	38	·00124	1192	·03908	15	·00049	40	·00131	112	·00367	1601	·05248
Grand Total .			44751780	10789	·02411	8048	·01798	84095	·18791	722	·00161	1918	·00429	5974	·01335	111546	·24925

It was not known at the time of writing this paragraph, that the Home Office had actually furnished the information required, respecting the ages of the persons committed for each class of crime, up till the year 1839; and that in subsequent years the returns have been presented in their present defective state. What could be the reasons for relinquishing their earlier plans, it is difficult to imagine. All the criminal returns for the six years 1834–1839, have been analysed, as shewn in Tables XXIX and XXX preceding for each class of crimes, and the population calculated by the formula given in pp. 2–3 *ante* for each year, and for each term of life, in order to discover the tendency at various ages to particular classes of crime.

These Tables explain themselves, being on precisely the same model as Tables I and II, only that Table XXX, instead of shewing the tendency to crime in the aggregate at each age, points out the tendency to particular classes or kinds of crime.

The following Abstract presents the general results arrived at:—

Ratio per cent. of Criminals to the Population, yearly, at various terms of life, in each class of offences.

Age.	Division. (1)	Division (2)	Division (3)	Division (4)	Division (5)	Division (6)
12 years and under .	·00019	·00053	·01259	·00009	·00004	·00008
16 years and above 12	·00811	·01574	·26513	·00108	·00160	·00330
21 16	·05622	·07613	·59929	·00428	·01208	·03326
30 21	·06800	·04643	·39109	·00394	·01114	·03798
40 30	·03757	·01383	·21374	·00191	·00631	·02074
50 40	·02195	·00510	·12938	·00174	·00401	·01099
60 50	·01538	·00258	·09136	·00123	·00191	·00825
Above 60 years . .	·00695	·00124	·03908	·00049	·00131	·00367
Total . . .	·02411	·01798	·18791	·00161	·00429	·01335

Number of the Population at various terms of life by which One Crime in each particular class of offences is committed yearly.

Age.	Division (1)	Division (2)	Division (3)	Division (4)	Division (5)	Division (6)
12 years and under .	526315.79	188679·25	7942·81	1111111·11	2500000·00	1250000·00
16 years and above 12	12330·46	6353 24	377·22	92592·59	62500·00	30120·48
21 16	1778·73	1313·54	166·86	23364·49	8278·15	3006·61
30 21	1470·59	2153·78	255·69	25380·71	8976·66	2632·96
40 30	2661·70	7230·66	467·95	52356·02	15847·86	4821·60
50 40	4555·81	19607·84	772·80	57471·26	24937·66	9099·18
60 50	6501·95	38759·69	1094·57	81300·81	52356·02	12121·21
Above 60 years . .	14388·49	80645·16	2558·85	204081·63	76335·88	27247·96
Total. . . .	4147·66	5561·73	532·20	62111·80	23310·02	7490·64

It will be recollected that when, on a former occasion, crime was viewed in the aggregate, the tendency to crime at various terms of life was shewn to follow a very remarkable law. From the age of 20 it was found that the tendency to crime in the male sex decreases at the rate of 33·333 per cent. for each term of life given in the Tables; but,

as anticipated, it will now be found that age becomes of still more importance in the investigation, when considering specific forms of crime. Some striking examples of this will be seen by referring to the preceding Abstract, and comparing the results in the different classes at ages "21 years and above 16," with the following terms of life, in which the tendency to crime is

In the class (1) of offences against the person at ages

21 years and above 16.....	·05622
30 ... ... 21.....	·06800

Difference = ·01178 or + 20·95 per cent.

Again, in class (2), offences against property, with violence, at ages

21 years and above 16.....	·07613
30 ... ... 21.....	·04643

Difference = ·02970 or − 39·01 per cent.

In class (3), offences against property, without violence, at ages

21 years and above 16.....	·59929
30 ... ... 21.....	·39109

Difference = ·20820 or − 34·89 per cent.

In class (4), malicious offences against property

21 years and above 16.....	·00428
30 ... ... 21.....	·00394

Difference = ·00034 or − 7·94 per cent.

In class (5), forgery and other offences against the currency

21 years and above 16.....	·01208
30 ... ... 21.....	·01114

Difference = ·00094 or − 7·77 per cent.

It is, therefore, obvious, that the law which regulates the tendency to crime at different ages is not the same in every class. For, while in the class of offences against the person, there is an increased tendency at "30–21" of 20·95 per cent. above that shewn in the preceding term of life, there is in all the other classes a less tendency, varying from 39·01 per cent. in offences against property with violence, to only 7·77 per cent. in cases of forgery and other offences against the currency. At other ages, like differences will be found. The difference between the tendency to crime in class (2) at ages 40–30 and 50 40 is, 63·12 per cent., but the difference at the same age in class (4) is only 8·90 per cent.

The importance to criminal jurisprudence of a solution of this problem must be evident. No preventive measures can possibly be adopted till the knowledge exists of the particular tendencies to certain propensities and forms of crime at different ages. With a clear knowledge of these, however, the chances of success in averting crime must be greater, as the means are furnished of knowing in what particular sections of the community the strongest tendency exists to specific forms of crime.

On reflection, it will now be seen, with still greater force than formerly, that a necessity exists for a very refined analysis in investigations on crime, before drawing any conclusions. The importance of determining the ratio of crime at the different terms of life, in order to know the relative amount of crime in different districts, as well as to understand whether crime be on the increase or decrease, has already been shewn. It also appears equally important to determine the tendency at the respective ages to the specific forms of crime, otherwise the perturbations of which the various classes are susceptible may vitiate conclusions based on any evidence resting on mere general averages.

In the final column of Table XXX, will be found the expression for the tendency to crime in the aggregate of those six classes during the years 1834–1839. In this Table a peculiarity will be observed in the division of ages, but the population has been determined for the same ages by the methods already pointed out. The present division of ages commenced only with the reports for the year 1842. It will be found that above 20 years of age the amount of crime was less in the years 1834–1839 than in the period 1842–1844, and the following Abstract will shew the relative amount and tendency to crime at the two periods referred to.

Age.	Ratio per cent. of Criminals in		Excess per cent. of Crime in 1842-4, above 1834-9.
	1842-4.	1834-9.	
15 to 20	·6841	·7839	— 14·588
20 ... 30	·6952	·5566	+ 19·937
30 ... 40	·3794	·2928	+ 22·825
40 ... 50	·2505	·1725	+ 31·110
50 ... 60	·1694	·1202	+ 29·044
60 and upwards . .	·0813	·0525	+ 35·424

From the preceding Abstract it will be seen, that from 20 to 60 years of age, there has been an excess of crime in the period 1842–1844 over that of 1834–1839, varying at the different ages within that term of life from about 20 to 31 per cent.; and it will be found, on referring to page 327, that the tendency to crime in the intermediate period of years 1840–1841 was something like a mean between the results given in the preceding Abstract, thus pointing to a gradual increase in the criminal calendar of the country within

those periods; but on examination of Tables XXII and XXIII, and also of the Abstracts on page 327 it will be found that a marked reaction, particularly in the male sex, took place in the years 1845–48. One striking feature in the preceding Abstract is the fact, that while above 20 years of age there has been an increased ratio of crime within the period of 1842–44, there has been at the period of life, 15–20, a decrease of crime amounting to 14·588 per cent.; and on referring to the Second Abstract on page 327, a further diminution of crime at the same period of life to the extent of 6·388 per cent. will be found. This is contrary to the popular opinion held on the subject; but the preceding part of this paper also shewed that all the facts of the case went to prove that there was no increase of juvenile crime, and that if any change or movement be discovered in the criminal returns of any particular district, that change will be found to be promoted, not so much by fluctuations at the terms of life 10–15 and 15–20, as by the increase or decrease among those persons of more advanced ages. It is thus evident that over a period of fifteen years, ending December 1848, instead of there being an increase, there has been a positive decrease of crime among the population at the younger ages.

From the following Abstract it will be seen that the great amount of crime is due to one class (3) of offences—that which includes "offences against property committed with-" out violence."

Age.	Aggregate Crime during 1834-9.	Class 3 during 1834-9.	Per centage of Crime due to Class 3.
12 years and under .	·01371	·01259	91·831
12 to 16	·29770	·26513	88·979
16 ... 21	·78386	·59929	76·453
21 ... 30	·55660	·39109	70·264
30 ... 40	·29282	·21374	72·994
40 ... 50	·17254	·12938	74·985
50 ... 60	·12018	·09136	76·020
60 and upwards . .	·05242	·03908	74·467

This Abstract at once points out the necessity for remedial measures being applied to the removal of this class of offences, which constitutes about three-fourths of all the crime in the country committed during maturer life. It will be further seen that nine-tenths of the whole amount of crime, by those of 16 years of age and under, is included in the same class; and, on reflection, it must appear evident, that very simple measures may, without difficulty, be employed by the legislature for the removal of the causes, or at least for the prevention of the great bulk of these offences.

Although this contribution has already extended to considerable length, every one giving attention to the many curious and most instructive results which have been arrived at on the question which, perhaps above all others, bears most directly on the

present and future happiness of the great mass of the people, will regret to find that any further useful inquiry and investigation into the progress of crime in this country must cease and determine with the close of the year 1848: and the cause of this cannot fail to evoke the strongest disapprobation of every one possessing the least philanthropy and sympathy for the moral and social condition of his countrymen; in fact, ever since the year 1839, the Home Office Returns have been periodically undergoing such changes, and have been from time to time presented to the public in so imperfect a shape and form, that at last they have become next to useless, and are now, not only wholly unavailable as aids in any correct inquiry into the state and progress of crime in this country, but are positively dangerous in the hands of mere cursory observers, and eminently calculated to lead them to the most fallacious and destructive conclusions. I should not therefore venture to dwell on any of the statements set forth in those Returns subsequent to the year 1848, were it not to place on record the startling fact, that while, not only in this country but throughout the whole civilised world, greater attention is year after year given to the development of improved statistical methods, in all matters which are likely to affect the moral and material progress of a people, or are even calculated to throw light on questions of merely a curious and speculative character, our Home Office Returns of Criminal Offenders have, for the last fifteen years, been barbarously retrogressive, and are, at present, in such a state as to be discreditable to the Government, and unworthy of a country laying so great pretensions to the promotion of economic and statistical science.

On referring to the facts recorded in Table XXVIII, preceding, and likewise to the Abstracts in pp. 389-90, it will be found that during the four years, 1836–9, the degree of instruction amongst criminals was not only given in the aggregate, but for the criminals in each division or class of offences. It has already been shewn how important it is to distinguish between the conditions and circumstances under which different kinds of crime are committed; but so far as education, or rather instruction, is concerned, this has been quite impossible ever since the year 1839. Again,

In the years 1834–39, as will be found, on referring to Tables XXIX and XXX, and likewise to the Abstracts of them in p. 395, that for that period of six years the ages of criminals were distinguished for each class of offences. Since the latter-mentioned year no such distinction has been observed in the published returns, and, consequently, ever since 1839 the curious, interesting, and instructive results disclosed in pp. 387–96 have remained completely isolated, and no one can tell how far the conclusions arrived at from the experience of those six years are justified by the progress and development of crime during the last fifteen years.

Again: from the year 1840 the ages of criminal offenders were given, not only for the whole kingdom in the aggregate, but for each county, until the close of the year 1848. In 1842 a new classification of ages however took place: accordingly, Tables I and

XXIII, inclusive, of this contribution will be seen to be based on this arrangement of facts, and have permitted an investigation to be made into the progress of crime, but without distinction of the particular class of offences in connection with age. It is however to be regretted that from the year 1848 this has been quite impossible, the published returns not containing the necessary elements.

There is still another defect in the Home Office Returns which cannot be passed over in silence. It has already been shewn that up to the year 1839 the Educational condition of Criminals was given, not only in their aggregate capacity, but for each particular class of offences, and from that time until 1848 the educational condition was given for the aggregate of all offences, but since then it will be found that no mention has been made as to whether a single criminal was capable of reading or writing, or possessed any degree of education or instruction whatever.

It consequently follows:—

(*a*). That since the year 1848, neither the age nor the educational condition of criminals has been given even for the aggregate of all classes of offences.

(*b*). Since the year 1839, nothing is known of the age of criminals in connection with specific classes of offences. And

(*c*). Since the year 1839, nothing is known of the educational condition of criminals committed under each class of offences.

These have been already shewn to be elements of vital importance in every inquiry into Criminal Statistics, and it is certainly surprising to find that, having been once recognised in the Home Office Returns, they should, in an age in which it is so well known statistical science is forcing itself on the consideration of Governmental Departments, be so systematically discarded. There is yet another change, of more recent date, to which it may be well to allude before concluding this subject.

On examination of the Home Office Returns, it will be found that, until the year 1851, they distinguished the numbers of males and females in each class of offenders in every County in England and Wales, without taking notice of the other important elements referred to in paragraphs (*a*), (*b*), and (*c*) immediately preceding; but since the year 1851, no distinction even of sex, has, under this meagre aspect of the question, been recognised by the authorities of the Home Office.

The following Tables, constructed from the published Returns for the years 1849-53 inclusive, are therefore only given by way of contrast, and as a practical illustration of the changes of which a Governmental Department is really capable of effecting at a time when the Governments of Europe and America are, by their Deputies, periodically assembling in Congress to improve and systematise the records of all facts and phenomena bearing on the happiness, prosperity, social progress, and moral and intellectual elevation of the people.

Table XXXI.

Number of Criminals in each County during the Five Years 1849-53.

County.	Offences against the Person.	Offences against Property with Violence.	Offences against Property without Violence.	Malicious Offences against Property.	Forgery and Offences against the Currency.	Other Offences.	Total of the Five Years, 1849-53.	Average for each Year.
Bedford	48	86	692	38	20	12	896	179
Berks	137	102	1376	40	31	53	1739	348
Bucks	78	121	1001	30	27	29	1286	257
Cambridge	126	90	1241	61	33	12	1563	313
Chester	393	335	3927	44	108	116	4923	985
Cornwall	124	85	888	16	13	36	1162	232
Cumberland	76	44	573	2	12	44	751	150
Derby	149	111	859	10	39	66	1234	247
Devon	279	197	3252	70	59	61	3918	784
Dorset	81	80	1011	16	13	44	1245	249
Durham	140	93	1309	14	77	89	1722	344
Essex	170	292	2368	64	62	54	3010	602
Gloucester	349	317	3928	31	75	150	4850	970
Hereford	67	127	931	11	16	74	1226	245
Herts	106	102	1176	44	71	32	1531	306
Hunts	62	39	339	18	12	10	480	96
Kent	387	329	3856	43	163	137	4915	983
Lancaster	1151	1398	13088	38	517	491	16683	3337
Leicester	122	84	1142	16	38	57	1459	292
Lincoln	209	162	2039	53	42	84	2589	518
Middlesex	1435	884	14990	40	1034	500	18883	3777
Monmouth	159	160	1501	3	39	39	1901	380
Norfolk	233	194	2881	68	40	81	3497	699
Northampton	103	86	1085	25	16	85	1400	280
Northumberland	127	219	932	4	43	53	1378	276
Notts	133	135	1285	17	32	62	1664	333
Oxford	120	98	1149	35	24	44	1470	294
Rutland	17	14	116	8	1	6	162	32
Salop	114	130	1350	10	19	37	1660	332
Somerset	281	315	2989	43	43	76	3747	749
Southampton	215	188	2963	57	71	111	3605	721
Stafford	464	367	4086	29	145	158	5249	1050
Suffolk	185	185	2235	65	33	65	2768	554
Surrey	415	337	4331	29	301	70	5483	1097
Sussex	135	175	2010	29	47	86	2482	496
Warwick	272	419	3420	33	136	67	4347	869
Westmoreland	12	20	237	5	6	13	293	59
Wilts	134	119	1670	32	22	23	2000	400
Worcester	240	255	2336	14	61	49	2955	591
York	834	933	7859	85	270	281	10262	2052

The following is an Abstract of the preceding results, so far as the same is practicable, thrown into the same form as Tables XXVI and XXVII preceding.

Table XXXII.

Abstract of the Criminal Returns for the Five Years 1849–53, *so far as it has been possible to make the defective returns of those years available. From the explanatory remarks already furnished, it will be seen that no distinction of sex has been made, no return of ages is given; and therefore it has been impossible to apply the consequent corrections pointed out in the early part of this paper, as being so essential in every correct inquiry. No notice has been taken in the Home Office Returns for the same Five Years of the educational condition of offenders: and from these defects this and Table XXXI preceding cannot receive the same confidence as the other Tables of this contribution.*

Groups of Counties.—Inferior Degree of Education in the General Community.			Population, 1851.	Average Crime per Annum during 1849-53.	Ratio per cent. at all ages.
Least Agricultural	Group 1 sect. (*a*)	Lancashire, Stafford, Monmouth, Chester, Warwick	3,728,108	6621	·178
		Excluding Lancashire	1,696,872	3284	·194
Greatest	Group 2 sect. (*a*)	Bedford, Essex, Cambridge, Suffolk, Hunts	1,080,599	1744	·161
Greatest Manufacturing	Group 3 sect. (*a*)	Stafford, Lancashire, Chester, Notts	3,366,104	5705	·169
		Excluding Lancashire	1,334,868	2368	·177
Least	Group 4 sect. (*a*)	Cambridge, Essex, Huntingdon, Rutland	641,889	1043	·162
Manufacturing interest 33⅓ per cent. above the average	Group 5 sect. (*a*)	Stafford, Chester, Lancashire, Notts, Warwick	3,841,117	6574	·171
		Excluding Lancashire	1,809,881	3237	·179
Agricultural interest 50 per cent. above the average	Group 6 sect. (*a*)	Bedford, Suffolk, Cambridge, Essex, Hunts, Wilts	1,334,820	2144	·161
Manufacturing and Agricultural interests nearly equal	Group 7 sect. (*a*)	Hereford, Bedford, Norfolk, Salop	912,022	1455	·159
Greatest wealth	Group 8 sect. (*a*)	Devonshire, Gloucestershire	1,025,903	1754	·171
Least wealth	Group 9 sect. (*a*)	Monmouth, Bedford, Hunts, Stafford	954,795	1705	·179
		Group in which those signing with "Marks" exceed the average by 33⅓ per cent.	1,682,241	3021	·180

Groups of Counties.—Higher Degree of Education in the General Community.			Population, 1851.	Annual Crime per Annum during 1849-53.	Ratio per cent. at all ages.
Least Agricultural	Group 1 sect. (*b*)	Durham, Surrey, Northumberland, Derby, Gloucester	2,132,536	2934	·138
Greatest	Group 2 sect. (*b*)	Bucks, Lincoln, Hereford, Rutland, Berks, Wilts	1,133,703	1800	·160
Greatest Manufacturing	Group 3 sect. (*b*)	Middlesex, Derby, Leicester, Warwick	2,887,981	5185	·179
		Excluding Middlesex	1,001,405	1408	·141
Least	Group 4 sect. (*b*)	Sussex, Lincoln, Hereford	859,555	1259	·146
Manufacturing interest 33⅓ per cent. above the average	Group 5 sect. (*b*)	Middlesex, Surrey, Derby, Leicester	3,096,050	5413	·174
		Excluding Middlesex	1,209,474	1636	·135
Agricultural interest 50 per cent. above the average	Group 6 sect. (*b*)	Bucks, Sussex, Lincoln, Hereford, Rutland, Berks	1,216,326	1896	·156
Manufacturing and Agricultural interests nearly equal	Group 7 sect. (*b*)	Dorset, Southampton, Northampton	801,957	1250	·156
Greatest wealth	Group 8 sect. (*b*)	Cumberland, Surrey, Westmoreland	936,861	1306	·139
Least wealth	Group 9 sect. (*b*)	Bucks, Derby, Notts, Northampton	942,614	1117	·118
		Groups in which those signing with "Marks" are less than the average by 25 per cent.	2,362,247	2967	·126

Table XXXIII.

Number of Criminals in each County during the Two Years 1854–5.

County.	Offences against the Person.	Offences against Property with Violence.	Offences against Property without Violence.	Malicious Offences against Property.	Forgery and Offences against the Currency.	Other Offences.	Total.	Average for each Year.
Bedford	16	29	366	10	5	9	435	218
Berks	38	28	540	17	25	8	656	328
Bucks	24	46	458	10	8	7	553	277
Cambridge	19	26	438	9	5	7	504	252
Chester	149	130	1608	7	50	30	1974	987
Cornwall	49	32	401	5	11	23	521	261
Cumberland	31	17	206	3	6	11	274	137
Derby	81	61	419	7	28	7	603	302
Devon	80	62	1257	14	28	64	1505	753
Dorset	34	40	528	5	6	14	627	314
Durham	96	34	614	2	16	18	780	390
Essex	60	76	993	16	41	17	1203	602
Gloucester	85	89	1669	13	32	3	1891	946
Hereford	36	23	370	8	7	5	449	225
Herts	45	33	584	16	40	19	737	369
Hunts	20	7	131	15	2	...	175	88
Kent	127	100	1739	31	75	39	2111	1056
Lancaster	503	553	5179	19	230	121	6605	3303
Leicester	37	32	536	6	20	33	664	332
Lincoln	81	46	651	12	20	23	833	417
Middlesex	432	387	5997	22	495	115	7448	3724
Monmouth	64	42	624	5	13	14	762	381
Norfolk	86	57	1161	22	9	36	1371	686
Northampton	30	18	488	17	9	27	589	295
Northumberland	66	107	541	13	25	24	776	388
Notts	116	45	587	12	47	25	832	416
Oxford	33	32	498	5	11	10	589	295
Rutland	1	2	39	1	...	...	43	22
Salop	49	40	437	6	17	9	558	279
Somerset	73	107	1041	14	28	38	1301	651
Southampton	84	104	1246	17	34	20	1505	753
Stafford	154	160	1742	11	47	53	2167	1084
Suffolk	43	43	851	20	6	18	981	491
Surrey	155	112	1711	16	199	27	2220	1110
Sussex	75	42	855	8	11	28	1019	510
Warwick	88	171	1440	9	96	35	1839	920
Westmoreland	4	4	76	1	3	4	92	46
Wilts	36	38	624	10	15	8	731	366
Worcester	85	104	1024	6	26	23	1268	634
York	287	309	3259	23	104	106	4088	2044

The following is an Abstract of the preceding results, so far as the same is practicable, thrown into the same form as Tables XXVI, XXVII, and XXXI preceding.

Pembroke, the ratio of one crime yearly to every 360 of the population; but in Glamorgan, Lancaster, Middlesex, and Monmouth, the same tendency to crime would produce as high an average as from 1 in 325 to 1 in 313, being a difference of at least 18 per cent.* It is, therefore, evident, that the element of age is an essential item in every inquiry or investigation into the relative amount and progress of crime in different districts; and on the same evidence the element of sex must appear equally important; and hence calculations in which those elements are neglected cannot be relied on as shewing the relative amount of crime in different districts, nor in the same districts at different periods of time: for here we have an apparent difference of crime in some districts to the extent of 20 per cent. above that in others, in which the same tendency to crime has been assumed to prevail, accounted for by the simple fact of a difference in the distribution of their population; and other differences of even greater extent are found to depend on the relative proportion of the sexes in the respective districts. Hence the great necessity in all such inquiries, of having recourse to those elements, in order to determine the relative amount of crime, and the danger of depending on any conclusions arrived at by any methods of inquiry in which they are neglected.

6. That every properly conducted inquiry into criminal statistics, intended to shew the relative tendencies to crime in different districts, or in the same district, at different periods, must distinguish the amount and degree of crime in each sex, and shew the amount and tendency to crime for each sex and at every term of life for given districts at the respective periods of time†.

7. That the tendency to crime at each successive term of life given in the Tables decreases from the age of 20 at the rate of 33·333 per cent. for the male sex, and at the rate of 25 per cent. for the female sex‡.

8. That in some counties or districts, crime is upwards of 50 per cent. above the average of the kingdom, while in others it is nearly 70 per cent. below the average§.

9. That in all the agricultural groups of counties there seems to be a remarkable uniformity in the tendency to crime, varying in an excess of crime above the average for the whole kingdom of 5·3 per cent. to 6·8 per cent.; but in the mining and manufacturing groups of counties, although the whole combined shew less than the average crime for England and Wales, still in one portion of the groups there is an excess of 33·5 per cent. of crime; while in another, crime is 52·1 per cent. below the average‖; proving that there must be some powerful element in the social and moral state of the people, not eliminated in such combinations, producing this remarkable disparity.

10. That the usual test by which the manufacturing and agricultural counties are determined, may often be neutralized by a corresponding high or low ratio of agriculturists

* See Table VII.

† See Tables I and II, also Tables XXII and XXIII.

‡ See Tables I and II, also Tables XXII and XXIII; and likewise Abstracts pp. 326–7.

§ See Table XI.

‖ See Tables XII and XIII.

and manufacturers in each: but adopting corrections as in Tables XIV and XV, to avoid such errors, and testing the counties in which the most striking differences exist as to their agricultural and manufacturing conditions, it is found that the mere fact of such differences in the habits of the people has little or no influence on the increase or decrease of crime, and offers no solution to the problem of what is that element or feature which produces in one great community an excess of 52·1 per cent. of crime, and in another community reduces crime 33·5 per cent. below the average*.

11. That by adopting the test of education or instruction furnished by the marriage registers of the country, and further analysing the groups referred to in the preceding paragraphs, by dividing each into two sections—by the one of which will be represented the population of highest education, and the other the population of lowest education ;—in fact, so analysing the various districts and groups of counties, that they differ in respect of education only,—it is found, that out of the 22 different combinations formed of the various districts of England and Wales, in every instance there is an excess of crime where there is the least education or instruction: and comparing the respective sections of each group of counties, it will be seen that there is an average excess of 25 per cent. of crime in the sections of inferior education over that of higher education, and in some districts the excess is as much as 44 per cent.†

12. That it is hence obvious that the very small amount of education, or rather instruction, implied by the test here adopted, has a powerful influence on the criminal calendar of the country; and that the introduction of this further element into the investigation of the relative amount of crime, removes many anomalies not otherwise to be understood ‡.

13. That all the preceding conclusions are arrived at from facts derived from a source partly independent of the criminal population itself; but this Contribution also furnishes evidence establishing the fact, that invariably, in those districts in which there is an increased amount of crime, there is also a higher ratio of uneducated criminals, and in the less criminal districts a smaller proportion of the criminal population wholly destitute of the rudest elements of education; and, in following up this inquiry, the following remarkable combination of elements determine the great influence of education in the development of crime. The districts of the country in which the general population is the worst educated, the districts in which the greatest amount of crime prevails, and the districts in which there is the highest proportion of uninstructed criminals, are constantly found assimilating; while, on the other hand, those districts which are the best educated, the least criminal, and in which a smaller proportion of uneducated criminals prevails, are likewise found to be identified in the various combinations§: and hence the great reduction of crime to be justly expected from the general diffusion of education.

* See Tables XIV and XV.

† See pp. 363–4, and Table XVIII.

‡ See page 364.

§ See pp. 377–9, also Tables XXIV to XXVII inclusive.

14. That the highest proportion of criminals in the male sex wholly destitute of education is to be found in those committed for offences against property without violence —and least in the class of forgery and offences against the currency; but for the female sex, the lowest ratio was found in malicious offences against property, and the highest in the class of forgery and offences against the currency*.

15. That the simultaneous increase of education and crime does not necessarily prove that education has no material influence on crime, so long as the criminal returns shew that, all other conditions being the same, crime is at a minimum when education is at a maximum, and *vice versa*. Changes in the political, manufacturing, and commercial aspects of the country—alterations in the police and criminal laws—have all their influence; and although for a period, or even a long series of years, crime may be on the increase, education may still be importantly concerned in the repression of crime†.

16. When viewed in its aggregate character, it is found that at the inferior ages there is a greater tendency to crime than at superior ages; but when viewed in its specific character, it is found that this law does not prevail: for while, in the class of offences against the person, at ages 21-30 there is an increased tendency of 20·95 per cent. above that for the preceding term of life, in all the other classes there is a less tendency, varying from 39 per cent. in offences against property with violence, to only 7·77 per cent. in cases of forgery and other offences against the currency: and at other ages, like differences will be found‡.

17. That it is hence evident, that no conclusions, as to the prevalence of crime, can be safely arrived at in questions of criminal jurisprudence, unless a proper analysis be made for the districts under investigation, shewing the tendency which exists to the specific forms of crime—and that too for each sex and at each term of life: for here we find, for two terms of life, a difference of 60 per cent. in the amount of crime dependent on the relative prevalence of two specific forms of offences; and it consequently follows, assuming in different districts the criminal tendencies of the population to be precisely the same, that

(*a*), the fact of a difference in the distribution of the population at different ages will produce an apparent excess of crime, from the circumstance, that in some districts there is an excess of population at that term of life in which the tendency to some peculiar forms of crime is in maximum or in minimum;—or

(*b*), on the other hand, assuming the distribution to be nearly, or exactly the same in two districts, a difference in the tendencies to specific forms of crime may be concealed by the neglect of the element of age or sex, and the districts falsely concluded to be in similar conditions as to their criminal manifestations; and a third error,

(*c*), may result from the neutralising influences of these disturbing causes balancing each other. The excess of population at one particular term of life favourable to the

* See pp. 389–91, also Table XXVIII. † See pp. 390–1.

‡ See pp. 395–6, also Tables XXIX and XXX.

manifestation of a particular form of crime, may be counteracted by an equivalent amount of reduction in the tendency to the development of that specific form of crime: and hence all ignorance of these perturbations, and the remedial measures which a knowledge of them would induce. In criminal inquiries, therefore, they constitute elements of every correct investigation*.

18. That although it has been usual of late to refer to juvenile delinquency in explanation of the increase of crime in many districts, the facts here presented do not sustain the supposition. An inspection of the nine groups of combinations represented in Tables XII and XIII, will shew, both for the general result, and for each group, that any increase or decrease in the amount of crime, as compared with the average of the country, is not accounted for so much by fluctuations in the tendency to crime at ages 10–15 and 15–20, as by the increase or decrease of crime at more advanced ages; leading to the conclusion that in the juvenile period of life the tendency to crime is under the influence of more constant laws or elements, and therefore shews less fluctuation than in mature life, when the conduct and disposition of individuals come more under the control of external circumstances. Further, a comparison of the results set forth in Table I and in Table XXX, shews that, from 20 to 60 years of age, there has been a gradual increase of crime, from the year 1834 to 1844, of from 20 to 31 per cent. varying with the age; but during the same years there has been at the younger ages, 15–20, a uniform decrease of 14·588 per cent., and in the four years, 1845–8, a further decrease of 6·388 per cent.; thus proving, by the facts of the case, that during a period of fifteen years, ending December 1848, there has been a decrease of crime among the population at the younger ages.

19. That to one class of offences—those against property committed without violence, —are due three-fourths of the whole crime of this country; and among the population of 16 years of age and under, more than nine-tenths of all their crimes belong to this single class of offences†.

20. That the nature of these offences obviously places the offenders within the reach of such remedial measures as would certainly, to a great extent, remove them from the criminal calendar, and thus go far toward the prevention of at least three-fourths of the crimes of this country.

* See Tables I and II, and also Table XXX.

† See Table XXX.

INFLUENCE OF LOCALITY ON SICKNESS.

The next question to be brought under consideration is the Influence of Locality on the amount of Sickness among the members of Friendly Societies.

In Tables E and L, pp. 20–7 and 68–75 *ante*, the amount of sickness is given among a certain number of persons, at every year of life, expressed in weeks and decimals of a week; and in an adjacent column will be found the amount of sickness among the same number of persons in quinquennial periods of life, also the average amount of sickness to each individual per annum. In the same Table the amount of sickness under the various arrangements described for each of the Districts recognised in the Tables of Mortality is also given; and an inspection of the last column will give a general idea of the relative amount of sickness in those Districts.

Table V following has been formed from the last column of Tables E and L, by interpolating the terms for the intermediate years of age, by the method of third differences; and the adjusted results were afterwards obtained in the same manner as that described for the rates of mortality in Tables C and F, in the early part of this paper.

Owing to the greater practical convenience of collecting and arranging the data, as well as of subsequently applying the results to the more useful purposes of friendly societies, the amount of sickness throughout the whole of this paper is invariably expressed under the denomination of weeks. For example, in Table V, opposite to age 35, and under the head "Rural Districts," the decimal expression ·8991 signifies that the average amount of sickness to each individual per annum is that fraction of a week. And again, opposite the same age, in the column "City Districts," the average amount of sickness to each person in the course of a year is 1·2372 weeks. When, however, it is required to change the expression to the more scientific denomination of the fraction of a year, that may be easily done by multiplying any of the results by ·019165.

[An examination

Table V.

Average Sickness per Annum to each Person at the following Ages—Expressed in Weeks.

Age.	England and Wales.				Scotland.	Age.	England and Wales.				Scotland
	Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.		Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.
10	·2257	1·2666	·3453	·4659	·2197	56	2·5210	3·4903	3·5246	2·8956	2·8279
11	·4233	1·0820	·3453	·5616	·2197	57	2·7756	3·7450	3·7545	3·1371	3·0307
12	·5969	·9392	·3453	·6412	·2446	58	3·0811	4·0670	3·9932	3·4293	3·2841
13	·7205	·8382	·3453	·7046	·2945	59	3·4402	4·4564	4·2408	3·7722	3·5879
14	·8041	·7788	·3453	·7520	·3692	60	3·8531	4·9132	4·4973	4·1657	3·9423
15	·8437	·7612	·3453	·7833	·4689	61	4·3198	5·4373	4·7626	4·6099	4·3472
16	·8414	·7853	·3453	·7984	·5935	62	4·9308	6·1219	5·0357	5·1904	4·8894
17	·8397	·8069	·3674	·8117	·6946	63	5·6863	6·9670	5·3167	5·9073	5·5687
18	·8387	·8259	·4115	·8230	·7722	64	6·5862	7·9726	5·6054	6·7605	6·3853
19	·8381	·8424	·4777	·8324	·8264	65	7·6305	9·1387	5·9019	7·7501	7·3391
20	·8387	·8561	·5659	·8398	·8570	66	8·8192	10·4652	6·2062	8·8760	8·4302
21	·8397	·8678	·6762	·8453	·8642	67	10·0700	11·7646	6·7643	10·0679	9·6159
22	·8426	·8746	·7713	·8515	·8688	68	11·3829	13·0358	7·5761	11·3257	10·8964
23	·8475	·8767	·8511	·8585	·8709	69	12 7579	14·2817	8·6417	12·6494	12·2715
24	·8542	·8741	·9157	·8661	·8703	70	14·1949	15·4995	9·9610	14·0391	13·7414
25	·8630	·8649	·9650	·8744	·8672	71	15·6910	16·6901	11·5341	15·4947	15·3060
26	·8736	·8551	·9991	·8834	·8615	72	17·1025	18·1368	13·5632	16·9652	16·9019
27	·8802	·8504	1·0303	·8915	·8557	73	18·4205	19·8395	16·0483	18·4506	18·5292
28	·8827	·8529	1·0584	·8988	·8498	74	19·6479	21·7984	18·9894	19·9509	20·1877
29	·8810	·8626	1 0837	·9052	·8437	75	20·7818	24·0134	22·3864	21·4661	21·8777
30	·8753	·8794	1·1059	·9107	·8376	76	21·8312	26·4844	26·2394	22·9963	23·5989
31	·8655	·9035	1·1252	·9154	·8314	77	22·7113	28·6170	29·4479	24·3088	25·0897
32	·8630	·9287	1·1480	·9250	·8302	78	23·4252	30·4112	32·0120	25·4036	26·3501
33	·8677	·9551	1·1742	·9396	·8340	79	23·9730	31·8669	33·9315	26·2809	27·3800
34	·8798	·9827	1·2040	·9591	·8429	80	24·3545	32·9841	35·2065	26·9405	28·1795
35	·8991	1·0114	1·2372	·9836	·8567	81	24·5698	33·7629	35·8370	27·3825	28·7485
36	·9257	1·0414	1·2740	1·0130	·8756	82	24·8912	34·6970	36·3375	27·9052	29·4124
37	·9551	1·0819	1·3152	1·0474	·8970	83	25·3187	35·7864	36·7080	28·5086	30·1713
38	·9872	1·1330	1 3611	1·0869	·9210	84	25·8523	37·0310	36·9484	29·1927	31·0250
39	1·0221	1·1947	1·4114	1·1313	·9476	85	26·4920	38·4310	37·0588	29·9575	31·9737
40	1·0677	1·2669	1·4663	1·1808	·9767	86	27·2378	39·9863	37·0392	30·8030	33·0174
41	1·1002	1·3498	1·5258	1·2353	1·0083	87	27·5232	41·0552	37·0235	31·0985	33·7581
42	1·1398	1·4477	1 5901	1·2939	1·0512	88	27·3181	41·8378	37·0118	30·8440	34·1959
43	1·1786	1·5608	1·6593	1·3565	1·1053	89	26·7126	42·3340	37·0039	30·0394	34·3308
44	1·2166	1·6890	1·7335	1·4232	1·1707	90	25·6167	42·5438	37·0000	28·6849	34·1628
45	1·2537	1·8323	1·8125	1·4939	1·2472	91	24·0603	42·6673	37·0000	26·7804	33·6918
46	1·2900	1·9908	1·8964	1 5688	1·3350	92	22 0610	42·9661	37·0000	24·4216	33·6451
47	1·3417	2·1423	1·9954	1·6528	1·4397	93	19·6187	43·2402	37·0000	21·6085	34·0225
48	1·4089	2·2871	2·1095	1·7461	1·5612	94	16·7334	43·4896	37·0000	18·3411	34·8242
49	1·4915	2·4249	2·2388	1·8486	1·6996	95	13·4051	43·7143	37·0000	14·6194	36 0500
50	1·5896	2·5559	2·3831	1·9603	1·8548	96	9·6339	43·7143	37·0000	10·4434	37·7000
51	1·7031	2·6800	2·5426	2·0812	2·0269	97	6·6169	43·7143	37·0000	7·1026	39·0200
52	1·8335	2·8168	2·7144	2·2161	2·1950	98	4·3541	43·7143	37·0000	4·5970	40.0100
53	1·9808	2·9662	2·8985	2·3650	2·3592	99	2·0914	43·7143	37·0000	2·0914	41·0000
54	2·1450	3·1280	3·0949	2·5279	2·5194	100	2·0914	43·7143	37·0000	2·0914	41·0000
55	2·3260	3·3029	3·3036	2·7047	2·6756						

An examination of the rates of sickness as given for the Rural Districts will shew that it fluctuates up to the age of 32, and that from that age up to 87 there is a uniform and gradual increase. In the Town Districts the rate of sickness will be found subject to a similar increase from the age of 27 upwards; and in the City Districts the rate increases throughout the whole range of the Table. A comparison will shew a higher rate of sickness in the Town than in the Rural Districts, for the whole period of life. The rate of sickness in the City Districts will also be found higher than in the Rural Districts, from 23 to 63 years of age; it then continues at a lower rate up to the age of 75, when it again rises, and continues higher till the end of life. In the City Districts, from the age of 24 to 44, the sickness is also higher than in the Town Districts; but from 45 to 57 the rate in both Districts differs but little. After 57 years of age, to the end of life, there is a much higher rate of sickness in the Town than in the City Districts. The following Abstract of Table V will give a general view of the relative amount of sickness in the various Districts.

Ages.	Average Sickness per Annum to each person—expressed in Weeks.			
	Rural Districts.	Town Districts.	City Districts.	The Three Districts combined.
20	·8387	·8564	·5659	·8398
25	·8630	·8649	·9650	·8744
30	·8753	·8794	1·1059	·9107
35	·8991	1·0114	1·2372	·9836
40	1·0677	1·2669	1·4663	1·1808
45	1·2537	1·8323	1·8125	1·4939
50	1·5896	2·5559	2 3831	1·9603
55	2·3260	3·3029	3 3036	2·7047
60	3·8531	4·9132	4·4973	4·1657
65	7·6305	9·1387	5·9019	7·7501
70	14·1949	15·4995	9·9610	14·0391
75	20·7848	24·0134	22·3864	21·4661
80	24·3545	32·9841	35·2065	26·9405

Sickness will be found to follow to some extent the same law with regard to the influence of locality, that was observed to connect itself with mortality; being least in the Rural Districts, and increasing in amount in the other Districts; but it will be observed that the relation of cause and effect generally supposed to exist between sickness and mortality is not here manifested—in fact, the highest ratio of sickness is sometimes found associated with a favourable rate of mortality. In order to shew, however, the merits of this hypothesis for the general results of the Three Districts, a Table is subjoined shewing the increase per cent. in the rate of mortality in the Town and City Districts above the Rural, also the increased rate of sickness in the same Districts at the corresponding ages.

Age.	Increased Mortality per Cent. above the Rural Districts in the		Increased Sickness per Cent. above the Rural Districts in the		Age.
	Town Districts.	City Districts	Town Districts.	City Districts.	
20	27·6008	12·7200	2·1104	32·7650	20
30	5·4852	30·5204	0·4684	26·3338	30
40	20·4517	75·7842	18·6560	37·3419	40
50	35·5833	61·6666	60·7220	49·9182	50
60	51·5277	41·0185	27·5130	16·7200	60
70	43·2990	26·7248	9·1906	29·8191	70

In addition to this, abundant evidence, illustrative of this point, is furnished out of the present materials. For example, labourers, although influenced by the most favourable rate of mortality, are found to be subject to as high an amount of sickness as the general average; and so some other occupations also, in which the rate of mortality is also favourable, are found subject to a rate of sickness much above the average.

Again, the sickness among the sixteen trades referred to in pp. 58 *et seq.*, *ante*, is less than the general average, although, as has been shewn, they experience a greater mortality. Bakers also, at the early and middle periods of life, are less subject to sickness than the general average, and among them there is likewise a higher mortality. The class of Butchers seems to experience a very high rate of mortality, although not subject to above the average amount of sickness. In applying the test of mortality to various localities and employments there is no difficulty; but the case is very different in viewing sickness as an index of the sanitary condition of any trade or of any locality. What constitutes sickness in one case, is often a very different thing from that in another. The standard seems too indefinite and capricious; and although the results as obtained may be considered perfect for all the purposes of friendly societies, a careful inquiry will shew their vague nature for medical and other scientific purposes, unless carried further than the mere amount of sickness, without regard to the circumstances under which it has taken place, and the causes producing it. Taking two occupations—Tailors and Clerks—which happen to be of readiest reference, they are found subject to a very high rate of mortality; still they do not seem, particularly Clerks, to be subject to so much as the average amount of sickness; and on consideration of the nature of those employments, it will immediately suggest itself, that the same trivial circumstances which would be sufficient to disable Sawyers, and also Colliers and Miners, would have little effect on those following quiet occupations. Sawyers, Colliers, and Miners are subject to accidents and various injuries which cannot be considered constitutional disease or sickness; yet it entitles them to relief from benefit societies, and they will of course be returned on the sick list. Tailors and Clerks are less subject to those accidents, and accordingly their sickness is also less; the other classes, particularly Colliers and Miners, being much above the average.

But the most striking refutation of the theory, that sickness and mortality bear the relation to each other of cause and effect, will perhaps be derived from a comparison of the general results of mortality in friendly societies in England for all districts combined, as given in Table F, page 32, with that for Scotland in Table M, page 80 *ante*. The result of this comparison will be, that the rate of mortality in Scotland among the members of friendly societies is found to be much higher than among the same class in England; and if the theory just recited were to hold good, there should also be found a greater amount of sickness in Scotland; but an inspection of Table V in this paper will shew that such is not the case, and that instead of there being an increased ratio of sickness, the ratio is actually below that in England. Nothing further, therefore, need be said on this part of the subject; but the argument may be rendered more obvious by an inspection of the following Abstract, in which it will be seen that while the excess of mortality is uniformly against Scotland, the excess of sickness is as constantly against England.

Age.	Mortality per Cent. in		Excess of Mortality in Scotland per Cent.	Average Sickness yearly in		Excess of Sickness in England per Cent.
	England.	Scotland.		England.	Scotland.	
30	·7563	·7926	4·7997	·9107	·8376	8·0268
40	·9386	1·0767	14·7134	1·1808	·9767	17·2849
50	1·4267	1·5830	10·9538	1·9603	1·8548	5·3818
60	2·5054	2·9096	16·1331	4·1657	3·9423	5·3628

The nature of the information in the schedules relating to the societies in England would evidently satisfy many speculations as to the cause, duration, and mortality of sickness and disease; but as it is proposed to give in this paper a simple representation of the amount of sickness only in the different districts, all inquiries, however interesting and instructive, as to the ratio of sickness to mortality, under the various circumstances which present themselves of employment and disease, must for the present remain untouched.

The next part of the subject naturally arising in this paper is, the relation which the average amount of sickness, as developed by this inquiry, bears to the amount of sickness as hitherto shewn in other sickness Tables.

The only Tables published prior to the first edition of this work to which it is deemed necessary in the first place to make reference, are those contained in the Highland Society's Report for 1824, and the Tables given in the highly valuable work by Mr. Ansell on friendly societies, and published in 1835 under the superintendence of the Society for the Diffusion of Useful Knowledge. The following will shew the relative amount of sickness per annum to each person at given ages according to those Tables, and also according to the results of the present inquiry.

Table W.

Sickness per Annum to each Person—expressed in Weeks.

Age.	Highland Society.	Ansell.	Three Districts Combined, Table V.	Age.	Highland Society.	Ansell.	Three Districts Combined, Table V.
21	·575	·780	·8453	46	1·032	1·411	1·5688
22	·576	·785	·8515	47	1·108	1·475	1·6528
23	·578	·791	·8585	48	1·186	1·544	1·7461
24	·581	·798	·8661	49	1·272	1·619	1·8486
25	·585	·806	·8744	50	1·361	1·701	1·9603
26	·590	·815	·8834	51	1·451	1·791	2·0812
27	·596	·825	·8915	52	1·541	1·890	2·2161
28	·603	·836	·8988	53	1·633	1·999	2·3650
29	·611	·848	·9052	54	1·726	2·120	2·5279
30	·621	·861	·9107	55	1·821	2·256	2·7047
31	·631	·876	·9154	56	1·918	2·410	2·8956
32	·641	·893	·9250	57	2·018	2·586	3·1371
33	·652	·912	·9396	58	2·122	2·788	3·4293
34	·663	·933	·9591	59	2·230	3·021	3·7722
35	·675	·956	·9836	60	2·346	3·292	4·1657
36	·688	·981	1·0130	61	2·500	3·611	4·6099
37	·702	1·009	1·0474	62	2·736	3·991	5·1904
38	·718	1·040	1·0869	63	3·100	4·448	5·9073
39	·737	1·074	1·1313	64	3·700	5·001	6·7605
40	·758	1·111	1·1808	65	4·400	5·672	7·7501
41	·784	1·151	1·2353	66	5·400	6·486	8·8760
42	·814	1·195	1·2939	67	6·600	7·471	10·0679
43	·852	1·243	1·3565	68	7·900	8·659	11·3257
44	·902	1·295	1·4232	69	9·300	10·086	12·6494
45	·962	1·351	1·4939	70	10·701	11·793	14·0391

For the sake of a more convenient and general view of the relative merits of those different results, the following Abstract is given.

Age.	Annual Amount of Sickness to Each Person—expressed in Weeks.				
	Highland Society.	Ansell.	Average of all Districts, Table V.	Excess per Cent. above Highland Society.	Excess per Cent. above Ansell.
20	·575	·776	·840	31·5476	7·6190
30	·621	·861	·911	31·8331	5·4884
40	·758	1·111	1·181	35·8171	5·9272
50	1·361	1·701	1·960	30·5612	13·2142
60	2·346	3·292	4·166	43·6869	20·9798
70	10·701	11·793	14·039	23·7766	23·0636

The remarkable increase in the amount of sickness, as shewn by the present results, beyond the two other Tables, will no doubt appear very startling to those not intimately

familiar with the condition of friendly societies throughout the country. The rate of sickness as given in the Table of the Highland Society has been long and generally acknowledged to be much below the actual average, and even so far back as 1825 it was thought unfavourably of by a Committee of the House of Commons. It is unnecessary to enter into the objections against the nature and source from which the data for the Highland Society's Table were obtained, as that subject has been amply discussed elsewhere. For some time after Mr. Ansell's work appeared, it was thought that contributions calculated according to the increased amount of sickness shewn in his Tables would render friendly societies perfectly safe; but instances occur almost daily of societies breaking down, whose contributions approximate to those Tables; and recently the increased amount of sickness has become so apparent to the members of some of the best regulated societies, that meetings have been held, and reports of a very clear and apposite kind published, pointing to the increased amount of sickness as the cause of their falling condition. A knowledge of circumstances of this kind first led to the present inquiry, the original object of which was simply to answer the question, whether friendly societies were actually subject to a higher rate of sickness.

Mr. Ansell's data had reference to the five years 1823–27; and it is difficult to account for the difference between his Tables and the present results, unless it be considered that the imperfect manner in which the affairs of friendly societies at that period were managed, did not allow of so accurate information being then obtained as now, when required by Act of Parliament to make quinquennial returns. In Scotland, at the time even of collecting the data for this inquiry, it was found that quadruple the societies would have filled up schedules in competition for the prizes offered, but were prevented from doing so by the incomplete system in which their books were kept. It is not improbable that the difference of the two classes of results may be partially accounted for by the smallness of the numbers over which his observations extended, as in the aggregate they amounted to 24323 years of life only, or about 5000 persons for a period of five years. If this fact is considered, and at the same time the irregularities which peculiarity of employment and other circumstances have been shewn to produce, it will not be difficult to account for the discrepancy. If the nature of Mr. Ansell's treatise had required an enumeration of these features, it would have been interesting to have traced the cause.

It is not believed that the mere fact of small numbers would, of itself, be sufficient to account for the difference, without at the same time a peculiarity in the combination of the employments of the persons composing those numbers; for not the least remarkable feature which has appeared in the present inquiry is, the uniformity of the results as to sickness, with even smaller numbers than those included in Mr. Ansell's statement, when all the facts recorded were under similar circumstances as to locality and employment.

In order to give a still further and comprehensive view of the several Tables over periods of years, the following arrangement may be useful.

Table X.

Comparative amount of Sickness in various periods of Years according to the Sickness Tables of the Highland Society, the Tables by Mr. Ansell, and the Results of this Inquiry.

From Age.	Amount of Sickness in each period of Years—expressed in Weeks.				
	Highland Society.	Ansell.	Average for the Three Districts.	Excess per Cent. over Highland Society.	Excess per Cent. over Ansell.
20 to 30	5·870	8·060	8·7145	32·6410	7·5100
30 ... 40	6·728	9·535	9·9120	32·1227	3·8035
40 ... 50	9·670	13·395	14·7999	34·6617	9·4926
50 ... 60	17·827	22·565	27·0894	34·1920	16·7120
60 ... 70	47·982	58·717	77·3029	37·9290	24·0420
70 ... 80	...	...	205·3562	...	...
20 ... 40	12·598	17·595	18·6265	32·3652	5·5378
30 ... 50	16·398	22·930	24·7119	32·8775	7·2107
40 ... 60	27·491	35·957	41·8893	34·3723	14·1618
50 ... 70	65·803	81·279	104·3923	36·9650	22·1400
60 ... 80	...	...	282·6591	...	...
20 ... 50	22·268	30·990	33·4264	33·3820	7·2888
30 ... 60	34·219	45·492	51·8013	33·9416	12·1798
40 ... 70	75·473	94·674	119·1922	36·6796	20·5703
50 ... 80	...	...	309·7485	...	...
20 ... 60	40·089	53·552	60·5158	33·7545	11·5074
30 ... 70	82·201	104·209	129·1042	28·5841	19·2831
40 ... 80	...	...	324·5484	...	...
20 ... 70	88·071	112·269	137·8187	36·0965	18·5386
30 ... 80	...	...	334·4604	...	...
20 ... 80	...	...	343·1749	...	...

An inspection of the fifth and sixth columns of the above Table will afford the most conclusive evidence of the increased ratio of Sickness above that set forth in previous Tables. To those interested in the progress of friendly societies the results are highly important, as they will demonstrate the impossibility of permanence in those institutions on their present foundations. Considering the immense number of those societies which have broken down, it is lamentable to think that so little should have been done to ascertain the real nature and extent of the risks to which they are subject. It is still more remarkable that so many legislative enactments should have occupied the attention of the Government of the country from time to time, and that Committees also of the House of Commons should have had the condition of those societies for several years under con-

sideration, without any practical measure being carried out for collecting and arranging data in a proper shape to point out the true character of the liabilities to which they are subject*. In fact, the encouragement given to the formation of those societies by some recent Acts of Parliament should be regarded as an evil rather than as a benefit to the working classes. An immense number of societies were formed in a very short period, and their contributions regulated by the most delusive and inadequate data, so that at the present time very few are to be found calculated to survive many years. Under a scientific and amply developed system, those societies would be enabled, at no distant period, completely to remove the cause of nearly all that poverty, distress, and misery, which haunt our manufacturing towns, and fill our workhouses with the working classes of the country; but owing to the imperfect and unstable foundation on which they are at present built, instead of being a help and a support to a poor man, they involve him in those difficulties for which he might otherwise have provided. On becoming a member of such a society, he reasonably looks forward to it as a support for his declining years, and a protection during periods of sickness and disease; but ultimately, at the very time when assistance is required, he discovers that the society has been formed on a ruinous plan, that the increasing years and infirmities of its members have absorbed all its funds, and that those surviving must be thrown destitute on the parish as a public charity. To this, by the most ill conceived of all proceedings, the legislation of the Government has hitherto tended. Every facility and encouragement are given to the formation of societies, without any help or information for their management or guidance. The ship is cast upon the waves without rudder or compass, and the safety of the vessel left to accident and chance.

As stated, a Committee of the House of Commons in 1825, reported unfavourably of the table of sickness furnished in the preceding year by the Highland Society; still no other data were supplied on which any more confidence could be placed: the consequence was, that societies were formed, and continued to be managed, on calculations resulting from the same data; and, even up to the present time, thousands of those Societies are conducted either on those terms, or terms still less adequate to carry out the purposes contemplated.

An inspection of Column 4 of the preceding Table will shew that, in the decennial periods of life for 20–70, the friendly societies in England and Wales experience an excess of sickness of from 32 to 37 per cent. above that indicated in the Table of the Highland Society, or an average increase of sickness over the whole of that period of fifty years of 36·096 per cent.; or, in other words, friendly societies actually experience about one hundred and thirty-eight weeks' sickness in fifty years, while the Highland Society Table would lead them to expect eighty-eight weeks only.

* Since these remarks were written, in the year 1845, a Return of the Sickness and Mortality experienced by Friendly Societies, during the quinquennium ending the 31st of December, 1851, has been printed by the order of the House of Commons.—*See* Parliamentary Paper of 1853, No. 955, also that of 1854, No. 506.

The ruin of any society, under such conditions, is inevitable. There are many other errors in the rules of friendly societies, connected with the various benefits which they promise, calculated to ruin their schemes; but if it were necessary here to cite instances in which societies have suffered from the simple feature of excessive sickness, abundant instances could be pointed out; and the internal evidence contained in this paper, of the actual rate of sickness experienced by societies in the aggregate, must also prove that individual societies have been sufferers. In illustration of this point, it is impossible to avoid quoting a passage from a very able report, dated 8th of February, 1841, submitted to the Edinburgh Compositors' Society, by a committee appointed to revise the laws. They state, in their report, that the contributions and benefits of the society were regulated by the data of the Highland Society; and, in order to discover whether the experience of the society had harmonised with the original data from which their calculations resulted, an investigation of the actual sickness in the society was made, of which the following is an Abstract:—

Age.	Number of Members.	Actual Sickness in the Society.		Amount of Sickness Expected by the Highland Society Tables.		Excess of Actual Sickness.	
		Weeks.	Days.	Weeks.	Days.	Weeks.	Days.
20 to 30	732	979	1	417	0	562	1
30 ... 40	580	863	5	398	1	465	4
40 ... 50	126	191	5	129	3	62	2
50 ... 60	11	12	2	20	4	—8	2
Total.....	1449	2047	1	965	2	1081	5

It will thus be seen that the actual sickness experienced by this society has exceeded that contemplated by the Highland Society Tables by no less an amount than 112 per cent.

The following gives the amount of sickness as experienced by this society, and also according to the results of various Tables.

	Weeks.	Days.	Excess of Sickness in Compositors' Society, Weeks.	Days.
Amount of Sickness in Compositors' Society .	2047	1	...	...
Ditto, Highland Society Tables . . .	965	2	1081	5
Ditto, Ansell's Table	1357	0	690	1
Results as given in this Paper, City Districts, Table V	1748	0	299	1
Results as developed in this investigation. Printers . . .	2000	0	47	1
Results as developed in this investigation. Colliers and Miners .	2146	0	—98	5

or ninety-eight weeks and five days less Sickness in the Compositors' Society than among Colliers and Miners.

It will thus appear, that while there was in the society an excess of 112 per cent. above the Highland Society's Table, and also an excess of 51 per cent. above Mr. Ansell's Table, there is an excess of only 17 per cent. above the results obtained in the present inquiry, for the average of all trades in the City Districts, and of 2 per cent. above the general class Printers, which includes both Compositors and Pressmen; but there is at the same time also actually less sickness than among Colliers and Miners by nearly 5 per cent.

It has been shewn that particular trades and employments are subject to different degrees of sickness and mortality, and the importance of this element in considering the health of towns, and the influence of locality on the duration of life, has already been pointed out; but in viewing the condition of friendly societies, the necessity of considering the peculiar effect of certain trades and occupations must appear to be of vital importance. A most remarkable disparity exists between the rates of sickness prevalent in different places and in different employments, and societies may run the greatest hazard by incautiously adopting each other's regulations or tables; for so great is the distinction which obtains between the liabilities incurred from members of different trades, that what would be sufficiently safe for one society might completely ruin another. It may seem to some that the excessive amount of sickness experienced by the Compositor's Society may be accounted for by the fluctuation in small numbers, but on reference to the report itself such will not be found to be the case. The facts extend over a term of sixteen years, and the results for the various periods are pretty uniform, and cannot be looked upon as the result of any accident, but must be regarded as a distinctive and proper feature of that trade to which the members of the society belong.

In calculating Tables for the guidance of such a society, it would evidently not be safe to assume the results for the general average of the Country or a given District as a sufficient basis to proceed upon; for, allowing such to be the case, and adopting even the present results as a standard of calculation, there would still be 17 per cent. of the sickness in the above society unprovided for. The remark in respect to the rates of mortality in different trades and occupations, is also true of sickness: the present inquiry cannot therefore be regarded as complete till the results for the various employments are published.

Other societies in Edinburgh, it will be seen from a following quotation from the report in question, have also experienced an increased amount of sickness beyond the rates of the Highland Society's Table, although the sickness in those societies has not equalled in amount that of the Compositors' Society. It is stated that the sickness in those societies amounted "on an average to no less than 87 per cent. more than the Highland Society's rate." Considering this statement, from the accuracy of detail in other parts of the same report, to be correct, it seems to be a very remarkable coincidence, that in the City Districts, being that with which those societies should be brought into comparison, there is, according to the results of this investigation, at the same term of life also exactly 87

per cent. more sickness than that given in the Highland Society's Table. From 20 to 60 years of age, according to the Highland Society's Table, (see page 415,) there is forty weeks' sickness to each person; but according to the City Districts, Table V, there is seventy-five weeks' sickness, or 87 per cent. more than given in the Highland Society's Table.

The practical advantage of thus recognising particular districts and occupations is obvious; for had either of the preceding questions been tested by the results for the general average, no satisfactory solution could have been offered. Hence the reason why some friendly societies go on prospering, while others, under apparently the same management and scheme, survive but for a short term of years, ultimately to involve their members in ruin when most in need of support. The following Extract from the Report of the Committee in question is important:—

" The average annual sickness to an individual is as follows:—

	Compositors' Society.			Highland Society.		
	Weeks.	Days.	Hours.	Weeks.	Days.	Hours.
From 20 to 30 years of age, . .	1	2	1	0	4	3
... 30 ... 40	1	2	22	0	4	19
... 40 ... 50	1	3	3	1	0	4
... 50 ... 60	1	0	17	1	6	3

" From a comparison of these two rates, it will be seen that the sickness experienced by this society has been more than double that given by the Highland Society. Since ascertaining this result, the Committee have made various inquiries in order to ascertain how far this increase corresponded with the experience of other societies established on similar principles; and they have to report, as the result of these inquiries, that in Heriot's Benefit Society, the School of Arts, the Goldsmiths' Equitable, the Journeymen Goldsmiths', and in the Cabinet and Chairmakers' Societies, a very great increase had also been experienced, amounting, on an average of these societies, to no less than 87 per cent. more than the Highland Society's rate. Great, however, as this increase appears, it is easy to be accounted for when the state of societies is considered during the period embraced by the Highland Society's inquiry. It is well known that up to the period of the publication of the Highland Society's Report, societies generally partook very much of a charitable character, no member being entitled to benefits unless he was in indigent circumstances. Now, when it is considered that the Highland Society's rate of sickness was deduced from the amount of sickness experienced by the 79 societies above mentioned, during a period when they were formed upon this charitable principle, it is not to be wondered at that now, when they are established upon strictly self-supporting insurance principles, and when, in consequence, each member claims the utmost extent of the benefits, the sickness should be found to be so much greater than was at first

supposed. This, the Committee conceive, is quite sufficient to account for the great disparity between the rate of sickness given by the Highland Society, and that now found to occur among societies."

The preceding comparisons did not extend beyond 60 years of age; but, as will appear from subsequent illustrations to be given in this paper, the claims to be made by members after passing their sixtieth year become generally so alarming, as to be the usual means of awakening societies to the danger of their position. For example, although in the Compositors' Society all the members were under 60 years of age, still there was a large amount of what is called permanent sickness. At page 6 of the Report in question, it will be seen that of the members actually sick,

91·0	per cent. had	7½	weeks' sickness each;
3·5	...	69	...
And 5·5	...	246	...

It will thus appear, that the amount of sickness among 5·5 per cent. of the members was actually more than double that experienced by another class of the same society by 91 per cent. When the subject of permanent sickness is brought forward, its relation to age, its effect on the funds of a society, and the methods by which the future liabilities of a society may be determined, will be amply discussed.

Having entered so fully into the characteristic features of the Highland Society's Table, in relation to the results of this inquiry, a simple inspection of the Table at page 415, will be sufficient to shew to what extent Mr. Ansell's Table is liable to the same objections. At the decennial periods of life, from 30–70, it will be seen that there is an excess of sickness in the friendly societies in England and Wales over Mr. Ansell's Table, varying from 4 to 24 per cent., or a mean difference over the whole of that period of forty years of 19·283 per cent. This excess of sickness, as well as all the other results in page 415, are derived from making Table V the standard of comparison; but if Mr. Ansell's Table were taken as the standard of comparison, the deficiency in sickness over that period of years would be 23 instead of 19 per cent., and at ages 60–70 the deficiency would be 31 instead of 24 per cent., as given at page 415, or a deficiency of nearly one-third. But the inadequacy of his Table as a general guide for friendly societies, will instantly appear by making it bear on the results of Table V for the City Districts, in which, as already stated, the amount of sickness from 21–60 years of age is seventy-five weeks, being an excess over Mr. Ansell's Table, for that period of life, of no less than 41 per cent. The greatest care and discrimination should therefore be exercised, in established friendly societies, not to adopt general results for the guidance of particular classes. The laws of sickness and mortality are under peculiar modifications in each class, and must be developed before any safe practical conclusions can be arrived at, deserving of public confidence.

In connection with the preceding remarks, Odd Fellows will naturally inquire whether the same observations are equally applicable to their own Order or Institution. An analysis has been made of the return issued in October 1845, by the Board of Directors at Manchester; and among other important information, there is given the amount of sickness and mortality in the various districts of the Unity during the year 1844. An inspection of the results of this analysis is highly calculated to inspire confidence in the preceding observations, and to shew that the rate of sickness there developed is strictly applicable for the guidance of the Order. As the return by the Board of Directors extends over 3682 lodges, and about one quarter of a million of members, great care has been bestowed on the reduction of the analysis presented in the various parts of this paper, in order that it may be safely relied on as a standard for future reference.

The average age of the members in the Manchester Unity is stated by the Board of Directors to be 32 years, and the gross amount of sickness experienced by 243,122 members, being the average number during the year 1844, was 226,917 weeks, or ·933 weeks to each member. On referring to Table V, p. 409 *ante*, it will be found that at age 32 the average sickness per annum is ·9250 weeks,—or, when the necessary correction for the maximum ages is applied in the former case, producing, in both instances, 6 days 11 hours to each member, yearly. It must, therefore, be very gratifying to every one interested in the progress of Benefit Associations for the working and middle classes, to find, that the amount of sickness among the members of those clubs, however variously constituted, shews so near an agreement, and effects almost a perfect realisation of a permanent law of sickness.

Again: as to the mortality experienced by the Order, the same conformity to the results given in these Contributions will be found to manifest itself. Every previous investigation into the laws of mortality produced the conviction, that the lives of the working classes of the country were of shorter duration than those of the upper classes, and also of less value than the average results for the whole kingdom: but here we have a confirmation of the fact, that the industrious workmen of the country experience an increased duration of life.

At age 32, the mortality of males for the whole of England and Wales is one in 95; the mortality in the Manchester Unity is one in 106; and, according to the results as given in this paper, for all classes in friendly societies at age 32, the mortality is one in 128. To illustrate further this point of the inquiry, the following Abstract will be useful, being an analysis of the actual results in the Manchester Unity of Odd Fellows for the year 1844.

In explanation of this Table, it may be stated that the Rural District is composed of those places the population of which is under 5000, the Town District of those places the population of which is 5000 and under 30,000, and the City District of such places as have a population of 30,000 and upwards.

TABLE Y.

District.	Average No. of Members during 1844.	Deaths of Members.	Death of Members' Wives.	No. of Week's Sickness.	No. of Members out of which		Average Sickness yearly to each Member expressed in Weeks.
					One Member died.	One Member's Wife died.	
Rural . . .	66208	608	434	57795	108·89	152·55	0·873
Town . . .	77070	700	554	70435	110·10	139·01	0·913
City	99848	978	662	98687	102·09	150·83	0·988
Whole Unity* .	243126	2286	1650	226917	106·35	147·34	0·933

During the year 1844, it will be seen that the mortality for the whole Unity was, as already stated, about one to every 106 members; while for the Rural districts it was one in 109, for the Town districts it was one in 110, and for the City districts it was one in 102.

The average amount of sickness to each member during the same year was, for the—

Rural Districts . . . . 0·873 weeks, or 6 days, 3 hours.
Town Districts . . . . 0·913 ... 6 ... 9 ...
City Districts . . . . . 0·988 ... 6 ... 22 ...
Whole Unity . . . . . 0·933 .. 6 ... 13 ...

But according to the results in these "Contributions," already adverted to, the average amount of sickness for the same districts would be—

Rural Districts . . . . 0·863 weeks, or 6 days 1 hour.
Town Districts . . . . 0·929 ... 6 ... 12 ...
City Districts . . . . . 1·148 ... 8 ... 1 ...
Three Districts combined . 0·925 ... 6 ... 11 ...

In instituting the above comparison, it should be kept in view that the actual ages of all the members in the Unity during that year are unknown; but as the Directors, in their Report, have stated the average age to be 32, that age has been taken as the point of comparison. For refined purposes, objections can be brought against this step, but for the present illustration it is sufficiently correct.

Considering that the above results from the experience of the Order relate to one year only, it is the more remarkable to find them approximate so closely to the results given in the preceding portion of these Contributions from facts extending over several years.

It is evident, then, that the Manchester Unity of Odd Fellows is subject to as much sickness and mortality as that shewn in this paper. The evidence thus derived from the

* In the original Report issued by the Board of Directors, several errors occurred in the figures, but the above results are correct.

working of the Order itself, should be a sufficient answer to those who have hitherto argued that the favourable circumstances in which the members were placed, exposed them to less hazard than the members of ordinary friendly societies. The facts of the case, it will be seen, do not support the supposition. It is, therefore, obvious that rates of contribution less favourable than those set forth in the Tables here given, would be unsafe for the guidance of the Order.

Since these remarks were written, the question as to "Whether the experience of other friendly societies in regard to sickness was fairly applicable to Odd Fellow Societies," has undergone much discussion, and assumed a public interest.

The investigation, evidence, and reports published by Lord Beaumont's Committee of the House of Lords on Provident Associations, Sessions 1847–8, paper No. 126: and by Mr. Sotheron's Committee of the Commons, in the Session 1849, paper No. 548, also seem to be chiefly directed to the same question, namely, whether the data published by Mr. Ansell as well as the data in "Contributions to Vital Statistics," but more particularly the latter, were applicable to the purposes of Friendly and Odd Fellow Societies. By the witnesses examined before these Committees on behalf of the Odd Fellows, every species of evidence seems to have been urged to make it appear that the members of such clubs were not so liable to sickness as the members of friendly societies generally throughout the country; and the results of the publication by Mr. Ratcliffe, in the year 1850, acquire, in consequence, an additional interest: as they exhibit the actual experience of the Order, deduced from carefully conducted observations on the experience of the whole of the members during the three years of 1846–8; and they are valuable as testing the speculative opinions of the different witnesses examined by the Committee.

In the concluding portions of the earlier editions of the present treatise, published in 1845, we find the following remarks:—

> One of the most efficient means of awakening attention to the perilous condition of the Order would be the publication of well digested records of the experience of the various lodges, from the most remote periods of which their books admit; and a proper and skilful analysis of these extensively circulated, could not fail to give birth to much useful conversation and debate, ultimately resulting in important and highly beneficial reforms. Science would also be greatly aided by the facts and testimony of such records, and the literature of the Order acquire an importance in the community not otherwise easily attainable. The expense to each lodge of contributing its experience would be very trifling, while the advantages to the Unity would be immense.

It appears that Odd Fellows have acted on this advice; or, at all events, have followed in the precise course prescribed; for Mr. Ratcliffe, in his Report on the sickness experienced by the Order during the year 1848, says—

> The Bristol A. M. C. having empowered the Directors to issue return-sheets, to be filled up by each lodge, containing the initials, trade, and age of every member; and the amount of sickness and deaths

occurring during the year; and such resolution having been repeated at the Oxford and Southampton A. M. C.'s, the Directors, in accordance therewith, sent return-sheets to every district, to be by them forwarded to lodges, and the same have been duly completed and returned back to them, and form the first means ever taken by the Manchester Unity to ascertain the amount of sickness and mortality experienced by the Order. In going through such returns, I am of opinion that every attention has been paid to forward them as correct as possible; and having an opportunity, when calling upon Districts to fill up the returns for the lists of lodges, to call upon them to give me the age and number of deaths that had occurred during the same year, I availed myself of that opportunity of doing so, and these returns having been collected from different and independent sources, and perfectly agreeing with the returns received from lodges, is a sufficient proof, if any was required, of the correctness of such returns.

The following gives a succinct view of the data from which results in these Contributions, and also those of the Odd Fellow Societies are derived:—

TABLE Z.

Age.	Sickness for Quinquennial Terms of Life according to						Age.
	Data for England, *According to "Contributions to Vital Statistics."*			Odd Fellows' Data.			
	Population.	Sickness.	Average Sickness Yearly.	Population.	Sickness.	Average Sickness Yearly.	
21 to 25	106743	91419·850	·8564	95222	67095·278	·7046	21 to 25
26 ... 30	170241	153465·139	·9014	153133	117185·709	·7652	26 ... 30
31 ... 35	188030	173893·855	·9248	138355	119097·563	·8607	31 ... 35
36 ... 40	177441	190179·711	1·0718	109238	106872·707	·9783	36 ... 40
41 ... 45	142411	191443·567	1·3443	58483	71784·849	1·2274	41 ... 45
46 ... 50	114085	195891·714	1·7185	33878	55048·706	1·6249	46 ... 50
51 ... 55	81131	188482·281	2·3231	12632	27738·852	2·1959	51 ... 55
56 ... 60	57126	187222·283	3·2773	5120	17837·850	3·4839	56 ... 60
61 ... 65	34173	187894·567	5·4983	1871	10787·422	5·7655	61 ... 65
66 ... 70	21655	240976·141	11·1279	700	4848·564	6·9265	66 ... 70
71 ... 75	11420	210195·995	18·4056	206	2790·567	13·5464	71 ... 75
76 ... 80	5626	146594·853	26·0566	63	1041·708	16·5349	76 ... 80
81 ... 85	2002	56589·711	28·2665	24	600·855	25·0356	81 ... 85

It will be observed in the above figures that the rate of sickness at the earlier and more advanced periods of life is less, according to the experience of Odd Fellow Societies; in the middle period of life the difference is very little; and in the ten years, 56–65, the rate of sickness is higher than that given in these Contributions: and in reference to the differences existing between the two classes of results at the younger and older ages, there is a sufficient explanation to shew that they are due to accidental causes, and do not constitute any essential feature of difference depending on physical or social conditions peculiar to either class of results. An inspection of column 5 preceding, will shew that in the data connected with the Odd Fellow experience the numbers under observation after

the age of 65, are much too limited to admit of any results derived therefrom being safely relied on. In the term of life 66–70, the whole experience is confined to 700 years of life, or observations on about 233 members for a term of three years. Again, in the next quinquennium, the experience is limited to about 69 members only for the same period; and in the decennial term following, the whole experience does not embrace more than about 29 members—numbers obviously so small that it is impossible to place any reliance on the results. On the other hand, the data from which the results of these Contributions are derived for the corresponding terms of life are upwards of forty times the magnitude. It is therefore very much to be regretted that Mr. Ratcliffe should have allowed so very inadequate data to enter into any of the monetary Tables representing the contributions to provide sickness for the whole of life; or should have employed his data even beyond the age of 65, as the monetary expressions are those most likely to be questioned and reasoned upon by the members, who may thereby be led into serious errors. Beyond the age of 65, Mr. Ansell's data included only 373 years of life; but he did not carry his monetary Tables above the age of 70, and even up to that age he adopted sufficient means of correcting any irregularities likely to arise from the limited numbers immediately preceding that period of life.

There is another feature in the Odd Fellow results for ages under 35 or 40, which requires observation. The Manchester Unity of Odd Fellows, is under its present gigantic numbers, of but recent and of most rapid growth. In the year 1834, the number of members was about 60,000, and in the beginning of the year 1846, the time to which the data now collected relates, the number of members was 251,727, being an increase during the twelve years of about 19,000 yearly; but in consequence of the dimissions from the Unity, the number of new members has been much greater. The Directors say, in one of their Reports, that "The amount of initiation money which was received from members in 1844, being no less a sum than £49,382, it will be discovered, on reference to the list of lodges, that our increase of members in that year was only 21,461, and by these returns it is clearly proved that upwards of 40,000 members were initiated in 1844; thereby at once affirming, that upwards of 20,000 members left the Order in one year." Keeping in view, therefore, the immense influx of young members into the Unity, with the fact that the great bulk of them is under the age of 35, the average age of all the members being at the period to which the data in Table VII relates, about 33 years, it is obvious that at the younger ages, so long as such a mutation in the list of the members goes on, there must be recorded in the books of the society, and markedly so at the younger ages, a much less amount of sickness than the very same persons would be subject to under the usual quiet and permanence of the members of friendly societies in general. This remarkable fluctuation in the body of members of the Order, occasioned by the very extraordinary number of withdrawals, and the still more extraordinary augmentation of the numbers again by the admission of new members, although

greatly to be regretted, as depriving the Institution of what, under happier circumstances, would be its greatest recommendation, that of cultivating among its members settled habits of prudence and forethought, is, nevertheless, so long as such disturbing causes exist, calculated to reduce its liabilities very materially, and especially, recruiting the ranks with healthy and vigorous members, at the younger ages, will shew at these terms of life, a diminished ratio of sickness. However, after the age of 35 or 40, the effect of this selection or influence will not be so visible, if it does not entirely disappear. A striking illustration of this is observable, by comparing the results of the Odd Fellows, and of the data in these Contributions between the ages of 40 and 65, in which the coincidences of the two rates of sickness is certainly remarkable, considering the very different sources of the data, and the different circumstances under which they were collected.

TABLE AA.

From Age.	Amount of Sickness experienced in passing through the following terms of life, expressed in weeks, according to the results of		
	The "Unity."	"Contributions to Vital Statistics."	Difference per Cent.
60 to 65	27·2239	27·0894	— 0·49
50 ... 60	26·1073	26·6338	+ 1·97
50 ... 65	53·3312	53·7232	+ 0·72
45 ... 65	61·1277	62·0334	+ 1·46
40 ... 65	67·0746	68·5131	+ 2·08

The preceding Table will suffice to convey a general idea of the results now given to the public by Mr. Ratcliffe, and their relation to those of preceding inquiries. In his interesting volume there are many subjects of importance treated, but there is only space for a very few further remarks, connected with sickness peculiar to different occupations. The results are given for 26 different trades, but the number under observation in the majority of groups is so small, that it is surprising Mr. Ratcliffe should have thought so limited data of importance enough to induce him to calculate an independent series of results for each. The following are the only groups of sufficient magnitude to deserve attention:—

Occupation.	Aggregate amount of sickness experienced in passing through the following periods of life.	
	From Age 30 to 40.	From Age 40 to 50.
Blacksmiths	8·5676	13·2624
Bricklayers, Plasterers, and Slaters	8·8554	12·8471
Carpenters	9·0781	10·8080
Agricultural Labourers	10·1360	14·1457
Town and City Labourers	10·7897	14·9163
Mill Operatives	7·2435	12·0533
Miners	15·6215	25·5730
Plumbers, Painters, and Glaziers	8·6707	17·7194
Servants	7·5761	10·4663
Shoemakers	8·0200	12·0715
Spinners	9·4789	18·4460
Stonemasons	11·2959	16·4316
Tailors	9·6825	12·0638
Weavers	10·5768	13·9304

The preceding figures are sufficient to shew the remarkable influence of particular occupations on the amount of sickness; but the difference shewn by the above results is evidently, to some extent due to the fluctuation of small numbers, and cannot be taken as a true criterion of the sanitary condition of the different trades. Still, there can be no doubt but that occupation is a most important element, and should be kept closely in view by those connected with the formation and management of friendly societies. The neglect of this important consideration in the establishment of these provident associations, and the application of average results only, has frequently been the cause of their ruin.

Mr. Ratcliffe, at page 36 of his publication, has the following important remark on this subject. "It must be apparent that these lives will be existing under very different circumstances, and be affected by a different combination of trades. Mr. Neison's agricultural labourers form 33 per cent., and in the experience here given they form only 20 per cent. of the rural class; and if a larger per centage of similar trades, experiencing more than the average sickness, be combined in one more than in the other class, there will appear more average sickness existing in the first than in the other class, from not having that large per centage of those trades,—other circumstances being similar." Also, "in addition to being affected by a different combination of trades, the average sickness will vary according to locality. The persons resident in Glasgow and Liverpool, for example, experience such an average amount of sickness that, by being included in the City Districts, the bulk shews an excess of aggregate sickness (between the ages of 20–70) of 9·4416 weeks over the same class of Mr. Neison's; but, by being abstracted, the remaining portion shews a much less aggregate sickness than the one just named."

These observations prove how very needful it is to be careful in drawing conclusions from isolated observations; and that on nothing but extended experience, carefully analysed with a strict regard to all the circumstances connected with the data, can any reliance be placed. The results now submitted to the public as the experience of the "Manchester Unity of the Independent Order of Odd Fellows," can only as yet be regarded as an approximation to what, under a more settled and permanent state of the Institution, will be the average rate of sickness; and it would be only prudent for the directors and others taking an active part in its affairs, not to discard other data, but to regard their own more as an indication of the features peculiar to themselves, than as an ample and satisfactory body of facts by which they should be implicitly guided.

From the results now presented in connection with the working of the Order itself, it is plain that there exists no better foundation on which the members can base their calculations than the data and facts given in these Contributions; as the practical experience of the Unity is not only a confirmation of the laws of sickness and mortality herein developed, but almost an actual assimilation with them, and, so far as practical legislation is concerned, one might be used for the other. Admitting this, it will hence

follow, that the money tests hereafter given and derived from the data in these Contributions are equally applicable to the guidance of the Order of Odd Fellows; and any one objecting to a proposition to establish the Institution on a rate of contributions equivalent to the results of those data, must carry his objections much further, and object to the data themselves; but as it has been shewn that to object to the data would be to deny the experience of the Order, no such objections can be raised, and therefore the money tests and values to be hereafter presented will remain indisputable.

Another element to be kept in view while considering this question, is the influence of time in producing an average result. It might happen that a particular society or district may experience a reduced or an increased amount of sickness in a particular year; but were the observations extended over several years, the deficiency of one would be compensated by the excess of another year. More striking illustrations of this can be shewn in connection with the law of mortality. Even very large populations, such as the population of Glasgow, are subject to remarkable fluctuations, shewing an extreme difference in some years of about 68 per cent., or a mean fluctuation of about 32 per cent. An inspection of the total male deaths for all ages, for each of the ten years 1832–41 will render this evident.

Total Deaths in	1832...4811	Total Deaths in	1837...5423
...	1833...3229	...	1838...3490
...	1834...3255	...	1839...3898
...	1835...3726	...	1840...4470
...	1836...4334	...	1841...4514

It will further be seen, that those remarkable fluctuations are due chiefly to the mortality in mature life, and not to the mortality in infancy, as some writers have believed.

Year.	From 20 to 50.	In the First Year of Life.	Year.	From 20 to 50.	In the First Year of Life.
In 1832	1795	332	In 1837	1991	371
1833	902	306	1838	1010	336
1834	923	313	1839	966	318
1835	885	365	1840	1346	404
1836	1279	315	1841	1278	381

It appears, then, that while the extreme difference in the mortality from ages 20 to 50 is 125 per cent., for the first year of life it is only 32 per cent. If the mean fluctuation for ages 20 to 50 be taken, it will be found to be 53 per cent., while that for the first year of life is only 14 per cent. Were the inspection extended to the mortality of female life, similar results would be obtained. Notwithstanding the inferior numbers in infant life, the fluctuation is confined within narrower limits than the mortality of mature life; and this fact is in accordance with the doctrine of probability when applied to any other subject,

as well as to the mortality of life. For whenever the intensity which determines any result increases—or in other words, when the probability of any event approaches unity—so also will the fluctuation in a series of events be reduced in amount.

The folly of relying on limited observations for the guidance of any individual society or lodge, may be further proved by referring to pp. 417–20 *ante*, as well as from further illustrations to be hereafter given, in which it is shewn that the sickness in some trades differs widely; and when numbers are small, there must, of necessity, be also peculiarity of employment, and consequently a peculiar series of results. The same principle is disclosed by the facts set forth in the Abstract at p. 426 preceding, and in Appendix A of the Report by Lord Beaumont's Committee, Session 1847–8, Paper No. 126, which should be most carefully studied by those connected with the practical management of friendly societies. The following facts are also curious, and deserve the closest attention. In a Report made by Mr. Yeats in 1847, on the affairs of a friendly society in Aberdeen, the following statements are found:—

Age.	Number of Free Members on the Fund, from Oct. 1832, to Oct. 1846.	Years of Life during which the Society was liable for Sickness Allowances.	Amount of Sickness expected for the time during which the Society was liable.	Amount of Sickness actually experienced. (Seven days per week.)
		Yrs. Qrs.	Weeks.	Weeks. Days.
Under 21	7	13 3	9·887	16 3
21 ... 25	59	113 2	82·316	47 1
26 ... 30	95	213 2	162·440	159 0
31 ... 35	94	225 1	182·863	303 1
36 ... 40	76	208 3	187·166	183 3
41 ... 45	38	110 0	116·591	257 1
46 ... 50	14	40 3	59·433	91 0
51 ... 55	16	15 1	31·261	8 6
56 ... 60	1	4 0	10·360	0 0
Totals .	400	944 3	842·317	1066 1

"From the above it will be seen, that the actual experience of sickness has considerably exceeded the expected amount. The excess is 20·994 per cent."

"The excess of the actual experience of the society, above the Table in the Highland Society's Report, is 36·795 per cent.; the total amount of sickness according to which would have been only 673·854 weeks."

"The latest published Table of the Rate of Sickness in Scotland is that contained in 'Contributions to Vital Statistics,' by F. G. P. Neison, Table V. The amount of sickness, according to that Table, would have been 885·202 weeks, so that the experience of the society exceeds that in Neison's Table by 16·034 per cent."

"The experience of the society is indeed on a limited basis, embracing only 400 members, who have collectively been exposed to the risk during 944 years of life, and no

certain conclusion can be drawn from it; but the fact of there being an excess so considerable in amount, taken in connection with the fact, that wherever accurate observations have been made, the same tendency has always been manifested, ought to lead to watchful care and caution."

"The following Table shews, (1), The average time in each period of five years during which each member was entitled to Sick Benefit; (2), The amount of sickness which he was expected to experience, according to the data on which the contributions were calculated; and, (3), The average amount of sickness actually experienced by the members during each period:—

TABLE BB.

Age.	Average No. Years of Life in each quinquennium during which the Society was liable to each member.	Average amount of sickness expected for each member during the preceding period.	Average amount of sickness to each member actually experienced during each period.
	Years.	Weeks.	Weeks.
Under 21	1·964	1·412	2 347
21 to 25	1·924	1·395	0·799
26 ... 30	2·247	1·710	1·674
31 ... 35	2·396	1·945	3·225
36 ... 40	2·747	2·463	2·414
41 ... 45	2·896	3·068	6·767
46 ... 50	2·911	4·245	6·500
51 ... 55	2·583	5·210	1·433
56 ... 60	4·000	10·360	...

Again, at p. 29 of the Report made by the Second Quinquennial Committee of the Glasgow Thistle and Rose Society, in the year 1841, columns 2 and 4 of the following Table are found.

TABLE CC.

Average Yearly Sickness and Mortality in the Thistle and Rose Society, from December 1810 *to December* 1840.

Age.	Sickness experienced in		Mortality experienced in	
	Thistle and Rose Society.	Friendly Societies, England & Wales. Table E.	Thistle and Rose Society.	Whole Population of England & Wales. Table C.
25 to 30	·2178	·9014		
30 ... 35	·6850	·9248	2·4650	1·063
35 ... 40	·6467	1·0718	1·4550	1·157
40 ... 45	1·1930	1·3443	1·4779	1·319
45 ... 50	1·9702	1·7185	2·0685	1·560
50 ... 55	1·7951	2·3231	3·5256	1·935
55 ... 60	2·9619	3·2773	3·3333	2·529
60 ... 65	·5357	5·4983		

In regard to sickness, the following shews the average ratio per annum to each member, according to the actual experience of the Aberdeen Society, the Thistle and Rose Society, and the average for friendly societies in England and Wales, Table E, pp. 26–27 *ante.*

TABLE DD.

Age.	Average Sickness yearly to each Member, expressed in weeks, according to the experience of the		
	Thistle and Rose Society.	Aberdeen Society.	Friendly Societies in England and Wales. Table E.
25 to 30	·2178	·742	·9014
30 ... 35	·6850	1·346	·9248
35 ... 40	·6467	·879	1·0718
40 ... 45	1·1930	2·337	1·3443
45 ... 50	1·9702	2·233	1·7185
50 ... 55	1·7951	·555	2·3231

It is hence obvious that, although the members of the Thistle and Rose Society are resident chiefly in the City of Glasgow, they are subject to a remarkably low rate of sickness, while, according to the results for the Aberdeen Society, the rate of sickness is even higher than that for England and Wales by 16 per cent. It will also be observed that there is a striking illustration in the Thistle and Rose Society of a high rate of mortality, and a very low rate of sickness, while in the friendly societies of England and Wales the sickness is much higher, and the mortality lower. If reference be now made to the facts given in Mr. Ratcliffe's analysis of the Odd Fellow Sickness, he will be found to state, at p. 36, that "In addition to being affected by a different combination of trades, the average sickness will vary according to locality; the persons resident in Glasgow and Liverpool, for example, experience such an average amount of sickness, that, by being included in the City Districts, the bulk shews an excess of aggregate sickness of 9·4416 weeks over the same class of Mr. Neison's, but, by being abstracted, the remaining portion shews a much less aggregate sickness than the one just named," but, at p. 135 of his work, the results of the sickness for the Odd Fellow Lodges in Glasgow are furnished, and in the following Abstract the amount of sickness will be found contrasted with the results for the Thistle and Rose Society in the above city:—

TABLE EE.

Age.	Amount of Sickness experienced in passing through the following periods of life, according to		
	Odd Fellow Societies, Glasgow.	Thistle and Rose Society, Glasgow.	Excess per Cent. of Odd Fellow Society above the other.
20 to 30	8·9107	6·847	30·140
30 ... 40	14·3855	6·421	125·284
40 ... 50	23·6009	16·135	46·272
20 ... 50	46·8971	29·403	59·498

The preceding results are certainly most curious, and cannot fail to occasion to those who seriously consider and study the subject, many important and interesting reflections on the state and condition of friendly societies. After a careful examination of the preceding facts, it will immediately appear to every intelligent observer, how very difficult must be the task of advising friendly societies and Odd Fellows lodges on the graduation of the scales to be adopted, under the peculiar circumstances of each lodge or society. It has always been a difficult matter to contend against the disposition which has long existed for the adoption of a uniform scale for all societies indiscriminately; even the two recent Committees of the Houses of Parliament have shewn a strong tendency in that direction, and nothing short of the production of the most striking examples of the failures and dangers of such a course could have prevented the adoption of model Tables, to be used as applicable under all circumstances. It is, however, now abundantly evident, that the circumstances under which different societies are placed, are of such a nature as to cause the most striking differences in their liabilities, and it is only a close and laborious study of the subject, which will qualify any one to give advice to the managers of them on the questions of most vital importance to their stability and permanency. The facts given by Mr. Ratcliffe for the Odd Fellows lodges in the City of Glasgow, do not extend beyond the age of 50, and, therefore, the comparison between them and the results of the Thistle and Rose Society, must be limited to that age; but so far as respects the rate of sickness in the Thistle and Rose Society itself, there is a curious circumstance, which it is important to describe for the benefit of those connected with the management of sick clubs, as proving how many causes affect the prosperity and liabilities of these societies, and how essential it is that all those elements should be well understood, before pronouncing on their state or condition. The following shews the amount of sickness experienced in passing through different periods of life, deduced from the actual experience of the society, from the year 1810 to 1848, contrasted with the results of friendly societies in England and Wales generally, as given in Table V, p. 409 *ante*.

TABLE FF.

Age.	Amount of Sickness experienced in passing through each period of life.		
	England and Wales.	Thistle and Rose Society.	Difference of Sickness per Cent. in the Thistle and Rose Society.
20 to 30	8·7145	6·8468	— 27·278
25 ... 35	9·2123	7·9468	— 13·408
30 ... 40	9·9120	6·4205	— 54·380
35 ... 45	11·7519	9·8710	— 19·055
40 ... 50	14·7999	16·1349	+ 8·274
45 ... 55	19·4607	25·8203	+ 24·630
50 ... 60	27·0894	41·7634	+ 35·136
55 ... 65	42·5727	56·5032	+ 24·654
60 ... 70	77·3029	107·0837	+ 27·811
20 ... 55	44·5769	45·5842	+ 2·210
55 ... 70	93·2418	132·6651	+ 29·716
20 ... 70	137·8187	178·2493	+ 22·682

There is here a very remarkable feature disclosed in the rate of sickness by which the above society is influenced; in each term of life under 40, the rate is uniformly and very largely under that for England and Wales, but above that age the difference is in the opposite direction. The sickness between ages 20–40, in England and Wales, exceeds that of the Thistle and Rose Society by 40·4 per cent., but from ages 40–70 falls short of it by 28·2 per cent. Again, between ages 20–55 the aggregate sickness differs by 2·2 per cent., but in the 15 years 55–70, the excess of sickness in the Thistle and Rose Society is about 30 per cent., and over the whole term of fifty years 20–70 the excess of sickness is 22·682 per cent. Hence, although the aggregate sickness in this society exceeds that of the average of societies in England and Wales, it is obvious that rates or scales of contributions and benefits, graduated according to the data for the kingdom at large, would be quite unsuited for this society or for any other, subject to a like peculiarity in the law of sickness. The greatest care and judgment are therefore necessary to discriminate the nature and extent of the sickness to which societies are subject. General results can only be useful for general purposes, but may lead to the most disastrous consequences if applied indiscriminately to individual societies. In some documents recently received from Dr. Watt, of Glasgow, relative to this society, the following figures are found:—

"Amount of sickness experienced by the society from the 1st of December, 1830, to the 1st of December, 1848, among all the members, between the ages of 19–70, and embracing 4279·25 years of life, compared with the sickness which would have been experienced according to the rates of other Tables."

"Actual experience of the Society	= 7214 weeks.
Mr. Neison's (Rural, Town and City Districts—England)	= 7398 weeks.
Town Districts	= 7694 weeks.
Mr. Ansell's Tables	= 6000 weeks.
Highland Society's Tables	= 4429 weeks.
Dr. Price's Hypothesis	= 5959 weeks."

It has already been stated that the mortality in this society has been remarkably high, compared to the amount of sickness; and what is deserving of observation, is the fact, that while the sickness under the age of 40, is 40·4 per cent. under the ratio for England and Wales, still the mortality at the same term of life is upwards of 35 per cent. above that of England and Wales.

The following are the results of the mortality:—

	From age 28-44.		From age 45-70.		Total.
Actual experience of the society from 1830–48	42	+	46	=	88
Expected Mortality according to Mr. Ansell's Table	39	+	39	=	78
... ... Northampton do.	54	+	45	=	98
... ... Carlisle do.	31	+	27	=	58

The affairs of this society appear to be managed with great skill and judgment, and although it cannot, either in respect to the number of its members, or the amount of its funds, be considered of equal importance to many societies in England, there is no society south of the Tweed conducted with more intelligence, nor furnishing more useful and valuable annual reports, which appear to be quite models for imitation by other societies.

In 1848, a very interesting report was made by Mr. Ansell, on the state of a large friendly society, established in an agricultural county in the East of England. The history and circumstances connected with this society are remarkable, and calculated to throw considerable light on the causes which frequently lead to the dissolution of provident institutions, shewing in a striking manner the danger of estimating from average results the liabilities of individual societies, even when established on an extensive scale. The following letter, received from the secretary of the society in 1843, describes in a brief manner its history, as well as the writer's views on the liabilities of friendly societies, prior to the publication of "Contributions to Vital Statistics."

Provident Society's Office, Chelmsford,
31st October, 1843.

Sir,

Remarking on the state of friendly societies—Enclosed I hand you a copy of the Rules, and the 25th Report of the Chelmsford and Essex Provident Society.

I had the honour of being associated with the Rev. R. G. Baker, at that time Curate of Springfield, but at present Rector of Fulham, in the establishment of this institution, and which I have conducted for more than a quarter of a century, during which time I have watched with no little care and anxiety its eventful progress.

When first contemplated, it was intended to limit it to Springfield, a rural parish, adjoining the Town of Chelmsford; this idea was abandoned, and it was finally determined that it should include a circle of four miles round the Shire Hall, making the Shire Hall the centre, or turning point.

Four years afterwards, the boundary was extended to seven miles round the Shire Hall, and, in the ninth year, the boundary wall was thrown down, and it now occupies the greater part of the county, having nineteen districts, besides the home district. It has between three and four hundred honorary members, and upwards of 5500 subscribing members, and a capital of £.25,000 nearly.

The business of the society was, however, conducted in Springfield more than twenty years, until it had fairly outgrown the accommodation there afforded. A more eligible situation offering itself, it was removed from Springfield into the town of Chelmsford.

I have not time to make any lengthened observations on the subject of friendly societies, but this much I venture to assert, that very little is known, or can be learnt of the actual rate of sickness experienced by members of friendly societies, because so very little attention has hitherto been paid to the subject.

Conducted as friendly societies mostly are, at a public house, where the business of the ill-paid clerk is to collect the monthly payments—to keep a sort of beer-score account thereof—to smoke his pipe,—drink his quart of beer,—lock up his book in the formidable box "with three locks and three

keys," until the following month, and then his labours end, without his giving the society's real interest a passing thought during the interval.

Then again the stewards, What are they ? or what knowledge do they possess ? Changed every three months, they know less, if possible, than the clerk: the office being generally filled by the poorer, and, consequently, more illiterate members, oftentimes not able to read their own names. This happens because they are chosen by *rotation:* the more intelligent members pay the fine rather than fill the office, consequently, the duties fall on the most incompetent.

Under these circumstances, and with such materials, it is no wonder that actuaries should come to wrong conclusions on the subject, and must do so until they have some data on which they can confidently rely.

So far as the County of Essex is concerned, I do not hesitate to say, that the calculations of the Highland Society are very much below the actual rate of sickness experienced by this society, and so are Mr. Ansell's;—I allude to sickness in early life.

There appears to me to be a great mistake in representing sickness, like a flight of steps, or Jacob's Ladder; judging from actual experience, I conclude that young persons have more sickness than actuaries give them credit for.

I have for eighteen years been engaged in collecting the experience of this society, as to the actual amount of sickness amongst the members of the different ages, and should I be spared to continue it for twelve years longer, I think it will make a good almanack for the County of Essex.

By making this new inquiry in Scotland*, I presume that time has told the tale in that country, that the calculations of the Highland Society are too low.

A series of reports I am not able to furnish you with, I merely retain a copy for my own use.

I thank you for the papers sent; accept my best wishes for success in your present undertaking.

Yours, truly,

JOHN BASSINGWHITE.

To F. G. P. Neison.

There can be no doubt that Mr. Bassingwhite has been a close observer of the progress of the society, and that, with one exception, his opinions may be regarded as founded on fact. The remarks about "Jacob's Ladder" only shew how very difficult it is for even those in the closest relations with the practical working or progress of a provident society, to judge with anything like accuracy of some of the most important elements of its liabilities; for, from the records of this same society, it will be found that sickness does actually increase in its intensity with the increase of age, following the law so well established by other results. But certainly, the amount of sickness experienced by the members is very high, and a consideration of the following results deduced from the report already referred to, is well calculated to shew, not only to Odd Fellows, but to friendly societies in general, the necessity of carefully viewing all the elements likely to affect their interests, and to prevent them from placing confidence in either isolated observations or aggregated general results:—

* Alluding to the prizes offered by the Author for the best returns from friendly societies.

Table GG.

Sickness experienced by the Male Members of the "Essex Provident Society," from its foundation in 1818, *till the year* 1847.

Age.	Number of Years in which Members were exposed to risk of Sickness.	Sickness.		Average Sickness according to "Contributions," for Eng. & Wales.	Excess of Sickness in the Essex Society, over England and Wales.	
		Gross amount experienced in weeks.	Average Yearly to each Member.		Difference.	Difference per Cent.
14 to 20	4926·50	5845·354	1·187	...	...	...
21 ... 25	9478·25	12234·286	1·291	·8564	+ ·4346	+ 50·75
26 ... 30	9464·50	12734·858	1·346	·9014	+ ·4446	+ 49·32
31 ... 35	7481·00	10765·571	1·439	·9248	+ ·5142	+ 55·60
36 ... 40	5494·75	8430·001	1·534	1·0718	+ ·4622	+ 43·12
41 ... 45	3941·25	6747·428	1·712	1·3443	+ ·3677	+ 27·35
46 ... 50	2783·00	5067·143	1·821	1·7185	+ ·1025	+ 5·96
51 ... 55	1413·50	4564·144	3·229	2·3231	+ ·9059	+ 39·00
56 ... 60	399·50	1945·286	4·869	3·2773	+ 1·5917	+ 48·57
61 ... 65	120·50	497·143	4·126	5·4983	− 1·3723	− 24·96
66 ... 70	32·00	510·999	15·969	11·1279	+ 4·8411	+ 43·50
71 ... 72	2·50	21·286	8·514	...	...	...
Total . .	45537·25	69353·499	1·501	...	...	...

From the preceding letter it will be observed that in 1843 the society had 5500 subscribing members; but at the period at which the above observations close, there were 6146 members, while the gross number of years of life to which members were exposed to the risk of sickness was no less than 45537·25 years, consequently, as the data have been collected from the experience of twenty years, the results may be considered to fairly represent the liabilities of any friendly society, the members of which are similarly circumstanced to those in the Rural Districts of Essex. The rate of sickness, it will be seen, exceeds that of friendly societies generally in England and Wales, by upwards of 40 per cent. If, therefore, in constructing Tables for such a society, or in estimating its liabilities, an actuary were to be guided by the rate for the whole kingdom, or for any one of the districts set forth in these Contributions, or in the similar districts of the Odd Fellow results recently published by the Unity, it is obvious that a most fatal error would be committed. The greatest care and judgment are consequently required, both in establishing friendly societies, and in remodelling existing ones, to ascertain the precise rate of sickness peculiar to the circumstances of the case, as nothing could be more fallacious and contrary to all experience and correct observation, than the application of a general rate of sickness indiscriminately to all societies. It is therefore to be lamented that in the present advanced state of the laws of sickness, some authorities should still, without distinction, issue to societies who may apply to them for advice, the same stereotyped set of printed Tables, whatever may be the circumstances in which they are placed.

As already stated, Appendix A of Lord Beaumont's Committee, Session 1847-8, paper No. 126, will be found to contain some remarkable examples of the different rates of

sickness to which societies are subject, but an interesting contrast to the results of the Essex Provident Society will be found in the experience of the Wilts Friendly Society. They resemble each other very much in respect to the rural character of the districts over which the two societies are distributed, but in the ratio of sickness experienced by them the difference is very great. Both societies were established in the same year, 1828,—both societies are widely spread over districts almost purely agricultural, and both societies contain a large number of members. The following shews the rate of sickness experienced by the male members of each society:—

TABLE HH.

Age.	Rate of Sickness expressed in weeks, experienced by		
	Essex Society.	Wilts Society.	Difference per cent.
21 to 25	1·291	0·743	72·409
26 ... 30	1·346	1·071	25·677
31 ... 35	1·439	0·929	54·897
36 ... 40	1·534	0·743	106·461
41 ... 45	1·712	0·486	252·263
46 ... 50	1·821	0·600	203·500
51 ... 55	3·229	0·843	283·036
56 ... 60	4·869	0·771	531·518
61 ... 65	4·126	1·929	113·893
66 ... 70	15·969	2·285	598·652

The following two examples will also shew, in a striking manner, the ratio of sickness experienced by two other societies circumstanced very similarly in dense City Districts.

TABLE KK.

Age.	Ratio of Sickness yearly to each person, expressed in weeks, experienced by		
	Liverpool Friendly Society, during 1836-40.	Old Provident Society, Leeds, during 1837-48.	Difference per cent.
21 to 25	·89	·18	79·78
26 ... 30	1·28	·38	70·31
31 ... 35	1·31	·58	55·72
36 ... 40	1·60	·66	58·75
41 ... 45	1·93	·87	54·92
46 ... 50	2·54	1·74	31·50
51 ... 55	3·96	2·60	34·34
56 ... 60	3·95	2·32	41·27
61 ... 65	6·74	5·84	13·35
66 ... 70	21·96	10·90	50·37

The difference in the preceding results is certainly very remarkable, and must satisfy every inquirer as to the danger and disastrous consequences which must follow the applica-

tion of uniform Tables to all societies. It is hoped the preceding illustrations will have the effect of preventing members of benefit clubs from falling into some of the more prevalent errors in the management of these institutions. Of late the attention of the noblemen and the more wealthy residents in the English counties seems in an especial manner to be given to the means of elevating the condition of the agricultural and working classes, by the establishment of well-constituted friendly societies, and it is hoped the present edition of this treatise will be carefully studied by them. The first thirteen editions of the pamphlet entitled "Observations on Odd Fellow and Friendly Societies" have been eagerly sought after by the working classes, and although they were sold at a price involving a considerable pecuniary sacrifice, yet should the publication of the present edition of this work, in an enlarged and permanent form, cause it to find a place in the libraries of the landed gentry, so deeply interested in the welfare of the people, the loss sustained will be amply repaid.

The evil effects resulting from Tables badly constructed for the special purposes of individual societies, can with difficulty be seen for some years after their establishment, but in the course of time inadequate contributions begin to tell, in too evident terms, the ruin and calamity which are fast hastening on the society. A large society in one of the mining districts of England, which literally subsisted for a period of sixty years, until the very last farthing of its funds was expended, without any efficient steps having been taken for its regeneration, broke down under the awful and melancholy spectacle of having upwards of 300 members, all aged 50 years and upwards, incapable of entering any other friendly society, and who had to no purpose contributed to the funds for many years. So dreadful a catastrophe is but of too frequent occurrence, and its appalling aspect is sufficient to destroy in the working man all confidence in the stability of such institutions. However, there are sufficient examples of successful management of other societies to encourage their affluent and benevolent patrons to increased efforts towards the improvement and perfection of the only institutions of the country which legitimately and distinctly call for the prudential self-efforts of the millions of the people towards their own regeneration. The following are extraordinary examples of the very different conditions of friendly societies established and uniformly conducted under the best intentions and desires for permanent prudential provisions for the members and their families. The different results ultimately arrived at in each society are most instructive.

According to the valuation made by Mr. Ansell in 1848, for the Essex Provident Society, the results arrived at:—

"Present value" of the benefits promised to the members, assuming that the experience of sickness in the society was no greater than that indicated by the results of Mr. Ansell's treatise		£208458·790
"Present value" of future contributions	£133517·573	
Accumulated capital	33000	
		£166517·573
Deficiency of the funds according to Mr. Ansell's estimate . . .		£41941·217

But if the liabilities had been valued according to the actual scale of sickness to which the members are subject, the deficiency would be double the above amount. It is certainly very much to be regretted that so unfortunate a state of things should exist, that a society having been established for so long a period, should not have discovered the fallacious principles by which it is guided. Had the members adopted the plan of having periodical investigations into its affairs, and a valuation of its assets and liabilities by a competent authority, there can be no doubt that the present ruinous mode of proceeding would long ago have been checked, and a remedy applied; but now that so many of the members are advanced in life, it becomes exceedingly difficult to devise any satisfactory means likely to be adopted and carried out by the members for improving its condition.

Mr. Sotheron's recent Act will, however, for the future, render it compulsory on societies to make a return, once in every five years at least, of their assets and liabilities: and if this provision of the Act be strictly enforced, there can be no doubt that the results arrived at will occasion much useful debate and inquiry among members themselves, and finally establish sounder and more correct notions as to the management and principles of friendly societies.

Although such has been the unfortunate progress of the Essex Provident Society, there are others established in the kingdom on very similar principles, which have flourished, and are now in a really prosperous and promising condition. The following examples, if contrasted with the preceding, will shew that the scale of contributions and benefits under which one society prospers, another may decay and suffer. In the Hitchin Friendly Society, the following are the results of a valuation made in 1849, of its assets and liabilities:—

"Present value" of gross liabilities	£9225 17 0
... ... assets	9509 4 11
Difference in favour of the society	£283 7 11

The Hitchin Society, like the Essex Provident Society, is in a Rural District, but it is not ramified over a large space and divided into numerous branches. However, the Wilts Friendly Society, has upwards of seventy branches spread over the county, and in this respect resembles the Essex Provident Society, and may therefore be brought into comparison with it. The following are the results of an estimate of its assets and liabilities made during 1850:—

"Present value" of its liabilities	£60610 15 5
... ... assets	61353 15 8
Difference in favour of the Society	£743 0 3

Although the surplus here is but small, still it shews a very different state of things from that which belongs to the Essex Society, and it is a subject of considerable interest to understand distinctly the cause of this. It has already been seen that the rate of sickness in the latter society exceeds that for all societies collectively in England and Wales, by more than 40 per cent., while the rate of sickness in the Wilts Society has actually fallen short of that for the societies of the Rural Districts of the kingdom, and hence there is, in this fact alone, an important reason for the prosperity of the one society, and the disastrous condition of the other. These examples should be sufficient to satisfy every inquirer of the difficulties which surround such questions, and the need of judgment and experience being brought to bear on all efforts made to regenerate old societies, or to establish new ones.

Since the preceding observations were written a Return of the sickness and mortality experienced by friendly societies during the quinquennium, ending the 31st of December, 1851, has been printed by order of the House of Commons, in Parliamentary Papers, No. 955 of 1853, and No. 506 of the year 1854. The data embraced by this Return extend to 792,939 years of life, and are therefore, in magnitude, second only to the data originally brought forward in these Contributions, which included 1,217,783 years of life.

Table LL.

Sickness and Mortality for Quinquennial Terms of Life according to the Government Returns relating to Friendly Societies in England and Wales.

1846–50.

Age.	Sickness.			Mortality.			Age.
	Number exposed to the risk of Sickness at each Age.	Total Sickness (in Weeks).	Average Sickness per Annum.	Number exposed to Risk.	Number of Deaths.	Mortality per Cent.	
10	16	20·571	1·2857	16	...	...	10
11 to 15	2939	2115·214	0·7197	2940	16	0·5442	11 to 15
16 ... 20	25087	24476·500	0·9757	25098	169	0·6734	16 ... 20
21 ... 25	88528	86781·071	0·9803	88556	645	0·7284	21 ... 25
26 ... 30	123624	122736·143	0·9928	123684	939	0·7592	26 ... 30
31 ... 35	126330	123377·500	0·9766	126402	1005	0·7951	31 ... 35
36 ... 40	114358	127975·143	1·1191	114458	1087	0·9497	36 ... 40
41 ... 45	94631	118405·786	1·2512	94692	1050	1·1089	41 ... 45
46 ... 50	77550	116491·000	1·5021	77649	1057	1·3613	46 ... 50
51 ... 55	54693	101470·500	1·8553	54778	950	1·7343	51 ... 55
56 ... 60	39974	92677·286	2·3184	40061	1009	2·5187	56 ... 60
61 ... 65	23438	78633·000	3·3549	23496	699	2·9750	61 ... 65
66 ... 70	13398	67801·286	5·0606	13462	648	4·9622	66 ... 70
71 ... 75	5591	47382·071	8·4747	5619	374	6·6560	71 ... 75
76 ... 80	2147	25432·071	11·8454	2163	222	10·2635	76 ... 80
81 ... 85	635	9650·000	15·1969	644	101	15·6832	81 ... 85
Total	792939	1145425·142	1·4445	793718	9971	1·2562	Total.

(see Table E, pp. 20–7, and Table L, pp. 68–75). The Government Returns therefore contain about 65 per cent. of the amount of experience embodied in the First and Second Editions of this Work, but not one half the extent of data now brought under consideration. On referring to p. 424, preceding, it will be found that the Odd Fellow data are not quite so extensive as the Government Returns;—they extend to 621,561 years of life. The preceding is a condensed Abstract of the Government Returns made from the results given in p. 2 of Parliamentary Paper, No. 955 of 1853.

In Table LL there are several features of interest to which it is important to make detailed reference.

It will be observed that between ages 11–40 the rate of sickness is higher than that contained in Table E, pp. 26–7, but after that age the ratio of sickness is very much less; and to this circumstance attention is, in the first place, directed; but in order to understand better the relation between the results of the Government Returns, and those deduced from other inquiries, the following Table is submitted.

TABLE MM.

Average ratio of Sickness, per annum, during each quinquennium, expressed in Weeks, according to:—

Age.	Table E, pp. 26-7.		Odd Fellows, p. 424.		Essex Provident, p. 436.		Government Returns, p. 440.	
	In each period = (*a*).	Σ (*a*).	In each period = (*b*)	Σ (*b*).	In each period = (*c*).	Σ (*c*).	In each period = (*d*).	Σ (*d*).
21 to 25	0·8564	0·8564	0·7046	0·7046	1·291	1·291	0·9803	0·9803
26 ... 30	0·9014	1·7578	0·7652	1·4698	1·346	2·637	0 9928	1·9731
31 ... 35	0·9248	2·6826	0·8607	2·3305	1·439	4·076	0·9766	2·9497
36 ... 40	1·0718	3·7544	0·9783	3·3088	1·534	5·610	1·1191	4·0688
41 ... 45	1·3443	5·0987	1·2274	4·5362	1·712	7·322	1·2512	5·3200
46 ... 50	1·7185	6·8172	1·6249	6·1611	1·821	9·143	1·5021	6·8221
51 ... 55	2·3231	9·1403	2·1959	8·3570	3·229	12·372	1·8553	8·6774
56 ... 60	3·2773	12·4176	3·4839	11·8409	4·869	17·241	2·3184	10·9958
61 ... 65	5·4983	17·9159	5·7655	17·6064	4·126	21·367	3·3549	14·3507
66 ... 70	11·1279	29·0438	6·9265	24·5329	15·969	37·336	5·0606	19·4113

From the columns headed with the symbol of summation, Σ, it will be seen that the aggregate amount of sickness between ages 21–65 is nearly equal in Table E and in the Odd Fellow data; while in regard to the Government Returns it will be found that the aggregate amount of sickness is about equal between ages 21–50; but after the age of fifty, in fact, after forty-five, the Government Returns exhibit a greatly diminished ratio of sickness as compared with any of the other Tables now under consideration, and to this feature of the Government Returns it is important to direct attention.

An examination of the rate of sickness given in page 413, *ante*, will shew that, above the age of 45, in the Government Returns, it is very much lower than even that of

Mr. Ansell's Tables; indeed, their rate of sickness is lower at age 45 than any other recognised Table extant; it will be further seen that, at the higher ages, the rate of sickness is a close approximation to that set forth in the now discarded Table of the Highland Society, and between ages 65 and 70 is actually about 35 per cent. less than that of the Highland Society. It is important to understand the reason of so low a rate of sickness at the advanced ages.

The solution of this strange and remarkable feature will probably be, to a great extent, if not wholly, accounted for by the following passages in the Government Returns themselves.

"The cases of superannuation were carefully separated from the mass, and subjected each one to a rigid scrutiny to determine whether it was a case of *chronic sickness* or a case of superannuation, in the sense of retirement on a pension for *old age*. Where it was the case of a man under 60 set down technically, and technically only, as superannuated, with a *possibility of his restoration* to health and position as a contributing member, that man's case was classed under the head of sickness; the principle being to retain as many of these cases in the latter category as possible. The sickness tabulated, therefore, is the whole sickness that could be ascertained to be really such."—Parliamentary Paper, 16th August, 1853, p. vi.

And again:

"It is clearly to be understood that although separate cases of sickness, occurring to the same individual during each year, were added together so as to make the return perfectly accurate, yet that nothing but sickness in the true sense of the word, that is, sickness incapacitating from labour, and *requiring constant medical treatment, and of limited duration*, as contradistinguished from *chronic ailment*, and mere decrepitude, was considered to be sickness. For instance, *slight paralysis*, *blindness*, *mental disorder*, or *senile infirmity*, cannot, it was thought, fairly be classed with the sickness commonly prostrating the workman, and for relief under the visitation of which he seeks the aid of a benefit club. In the abstraction of the data on which the Tables now submitted are founded, all cases of the *above*, or any other description of *chronic malady*, which were returned under the head or term of superannuation, were carefully eliminated, where no cessation of this title to relief, and where no return to the ordinary conditions under which allowances are drawn in sickness, could be perceived."—Parliamentary Paper, 12th August, 1854, p. 7.

The preceding is certainly one of the most extraordinary circumstances connected with any inquiry hitherto made, as to the prevalence of sickness in friendly societies. It would seem as if the whole object and purpose for which such societies are instituted were lost sight of. The benefits for which all societies profess to make provisions are, allowances to members during sickness, or rather incapacity, from either physical or mental causes, to follow their usual avocations or labours. It is nowhere a feature of a friendly society to guarantee allowances during temporary sickness only. If this were so, friendly societies

and benefit clubs would not be worth supporting, and having such objects only in view, they never could have enrolled the immense number of workmen which now belong to them. The great, essential, and the noblest feature in friendly societies of every description, is the certainty that, under a skilfully developed system, they will afford to members a competent support and complete independence during periods of sickness, incapacity, and disease, however protracted. The working man, for whom such societies are more particularly designed, may struggle against the difficulties of a temporary sickness without the aid of a friendly society, but few can hope to bear up against the vicissitudes invariably attendant on long protracted or permanent illness, and it is this condition of things for which not only the earliest but the most recently formed societies make special provision: and unless this integral element is allowed to have its full weight, the great principle which should govern every society is violated. It is quite true that, in many societies, even amongst those established of late years, a reduced amount of sickness allowance is granted during long continued sickness; but in no society worthy of the name does the allowance cease altogether, or fall to even so low a sum as four or five shillings weekly. An industrious workman with possibly a large family to support on so miserable a pittance, must be reduced to pauperism itself. Friendly societies fail in their mission when, by their rules, they sanction such degradation. At all times, even when science had not taken them under her protection, they aimed at other and nobler purposes than merely to allure the poor man into them for the purpose of ultimately placing him in the workhouse in his declining years, when much of all the sickness is of a permanent, or at least of a very protracted character. Their object is now, and always has been, a higher one. There is no reason why the sickness allowance should ever be reduced under eight or ten shillings weekly: and with such a sum an honourable struggle might be made for existence; but with less, the charm of independence is broken, and friendly societies become asylums for objects of charity, instead of self-supporting and dignified institutions, elevating the moral and social condition of the people.

If, therefore, the principle of some badly constituted societies of reducing the allowances so very low during long protracted or permanent sickness is to be so strongly condemned, what can be said of the extraordinary circumstance connected with the Government Returns now under consideration, in which all such elements of sickness are left out of the results which are submitted to the country for the guidance of its friendly societies? Had a scheme been purposely contrived to pauperize the members of all the benefit and provident clubs of the kingdom, it could not be more effectually calculated to do so, than by the dissemination with Government sanction of a ratio of sickness deduced from data, in which so vital elements are excluded as "chronic ailment," "mere decrepitude," "slight paralysis," "blindness," "mental disorder," and "senile infirmity." On referring to pp. 169–200 *ante*, it will be found that those are the very afflictions which press with unusual severity after members attain 45 or 50 years of age.

It is the proper function of a friendly society to enable the many to assist the few, and all properly developed data for the regulation of their risks, should be calculated to make provision for such contingencies and diseases as above enumerated, as well as for all others. It would however seem, as if those entrusted with the preparation of the Government Returns, had an idea that the best constituted friendly societies should only provide against "sickness incapacitating from labour, *requiring constant medical treatment*, and of *limited duration*." There is not an intelligent working member of a benefit club in the whole kingdom, who would subscribe to such a principle. At the superior ages, and long before the time of life when superannuation allowances, or strictly speaking, deferred annuities are granted, there is a large amount of protracted sickness experienced, as will clearly appear from results submitted in the subsequent part of this paper, and if during that period members who are afflicted are to be deprived of all benefit from the funds of their clubs, as the treatment of the Government Returns assumes, they must then be thrown on the charity of the country. The possibility of such a thing is, however, surely incompatible with the scheme of any properly regulated and self-supporting provident institution, and such a character all friendly societies which the Government encourages ought to maintain.

The history of this practice as introduced into many friendly societies, chiefly within the last thirty or forty years, is simply as follows. Societies generally, until quite recently, commenced their career with promising members benefits for which their contributions were wholly inadequate to make ample provision; but with the limited knowledge at one time existing of the laws of sickness and mortality, everything seemed to prosper for many years, until the members who, for the most part, entered such societies young, increasing in years and infirmities, made large inroads on the funds, and then the evils of the bad adjustment of benefits and contributions became apparent. Societies, when in this insolvent condition, soon began to have recourse to every possible expedient, except the right one, to prevent themselves from sinking, and amongst other means of propping up the falling institutions, the members, seeing the great drain on their resources on account of protracted and permanent sickness, very naturally under such circumstances, reduced the amount of the allowances. The reduction was, however, rarely so great as to bring the benefits to less than two-thirds or one-half of the full pay allowance. New societies starting into existence in succeeding years, very generally copied the schemes and regulations of their predecessors, and hence the practice of reduced benefits in long continued sickness. In every instance when the reduced allowance brings the benefit to so low a scale as to be no longer adequate with prudent management to support the member in sickness, he is necessarily thrown on the parish for support, and every such society should be discouraged as wanting in the essential characteristic of a well founded institution.

If, in the analysis of the Government Returns, the elements in question had been

eliminated from the general results in order to satisfy scientific curiosity, or otherwise, and if the nature and extent of them had been furnished in another part of the published Report, no objection could have been taken to such a course, but on the contrary, useful deductions might have been drawn from that mode of treating the data: but, unfortunately, these elements have been excluded from the general results, and no record of them is given by which any one can discover the actual amount of sickness to which the various societies included in the Government Returns have been subject. The consequence is, that practically, the Returns are for all the more important purposes of friendly societies entirely worthless, in fact, from the auspices under which such defective data appear, they are calculated seriously to undo much of the good, and to destroy many of the improvements, effected in the condition of those societies during the last ten years,—the period of greatest progress in their history. The evils to be so deeply lamented in the constitution of many societies, from the adoption of the data of the Highland Society, will be but little mitigated, particularly at the higher and more important ages, by taking the data now offered by the Government for their guidance. A Committee of the House of Commons reported unfavourably, so far back as 1825, on the Highland Society's Table; and before Lord Beaumont's Committee of the Lord's in 1848, and Mr. Sotheron's Committee of the Commons in 1849, conclusive evidence was adduced as to the dangerous character of the same Table. Since then, the experience of the Manchester Unity of Odd Fellows, and now the Government Returns themselves as decidedly prove the Highland Society's Table to be fallacious, and, as a consequence, demonstrate the inapplicability of the results of the Government data as now analysed for the purposes of friendly societies.

That the exclusion of the elements in question is the cause of the low ratio of sickness expressed by the Government Table, will appear evident from a consideration of the following analysis of a portion of the data appearing in this Contribution, as well as that already furnished in the five Abstracts in pp. 160–4 *ante*. On referring to Abstract D, p. 161, it will be found that the average duration of each attack of sickness not ending in death varied from four or five weeks' sickness at the younger and middle periods of life, to from 100 to 300 weeks at the more advanced ages; and, whatever may be the cause of this prolonged sickness, it equally incapacitates a member from following his occupation, and entitles him to the sickness allowances of his club. The following is a condensed Abstract of the experience of twenty-five societies over an average period of nearly twelve years each. It will be found full of curious interest and instruction, and is calculated to throw much light on the question now discussed.

It will be observed, from the results of the following Table, that from the youngest to the oldest age there is a rapidly increasing ratio of prolonged sickness. From 20 to 50 years of age the number of persons suffering from protracted sickness varies from about $2\frac{1}{2}$ per cent. to nearly 5 per cent., but after the latter age the increased number of persons

Table NN.

Ratio of Persons suffering from protracted Sickness to the total number Sick at various terms of life. The shortest duration of any one attack of what is termed protracted Sickness, being at least One Year.

Age.	(*a*) Total Number of Persons actually sick.	(*b*) Total Number of Persons suffering from protracted Sickness.	Ratio of (*a*) to (*b*.)
11 to 20	90	1	1·111
21 ... 30	847	21	2·479
31 ... 40	738	23	3·116
41 ... 50	548	27	4·927
51 ... 60	345	48	13·910
61 ... 70	175	80	45·714
71 ... 80	58	41	70·690
81 ... 90	17	15	88·235
Total . .	2818	256	9·084

liable to diseases of long duration is very considerable, and must tell seriously on the funds of a society. Between ages 61–70, upwards of 45 per cent. of all the persons sick are attacked with affections which either permanently incapacitate them, or from which recovery does not take place for upwards of one year from the date of attack. It is hence abundantly evident that every society must make some provision for this class of its members. Even at the term of life 51–60 the protracted sickness is about 14 per cent., and the neglect of a small number of such cases in the analysis of the Government Returns will fully account for results so discordant with every other series of observations. It has already been shewn in Table MM that at ages under 45 the ratio of sickness is somewhat higher in the Government Returns than according to the results of this inquiry; in fact, the aggregate sickness between ages 21–50 is, as nearly as possible, the same. In the subsequent terms of life, however, the Government Tables exhibit a very reduced ratio of sickness. The cause of this will appear evident from the facts adduced in the preceding Table. "Chronic ailments," "mere decrepitude," "slight paralysis," "blindness," "mental disorder," and "senile infirmity," are affections characteristic of advanced ages, and usually of a protracted nature, and their exclusion must produce results such as those appearing in the Government Returns.

Some of the societies in Scotland, whose experience is recorded in Table L, pp. 68–75 *ante*, make a distinction between acute sickness and that which permits of "walking about" out of doors. This latter sickness, in many instances, resembles the "protracted sickness" of the preceding Table, and the ratio of it to the total sickness will accordingly be found to increase with increase of age. The following is the result of an analysis of the sickness experienced by the societies which make the distinction now explained.

Table OO.

Ratio of "Walking about" Sickness to Total Sickness at various terms of life—expressed in weeks.

Age.	Population.	Total Sickness.	Walking about Sickness.	Ratio of Walking about Sickness to Total Sickness.
10 to 15	133	29·000	13·286	45·813
16 ... 20	1049	958·428	574·714	59·964
21 ... 25	4139	3807·714	2083·571	54·720
26 ... 30	6845	5830·285	2951·285	50·620
31 ... 35	7182	5681·429	2680·427	47·179
36 ... 40	6697	5929·999	3307·713	55·779
41 ... 45	5613	6345·142	4176·000	65·814
46 ... 50	5015	7495·571	4643·856	61·955
51 ... 55	4234	9812·714	6735·570	68·641
56 ... 60	3204	9615·572	7073·571	73·564
61 ... 65	2163	10558·572	8899·236	84·285
66 ... 70	1164	12203·142	9868·285	80·867
71 ... 75	616	10147·714	8400·143	82·779
76 ... 80	330	7315·714	6472·286	88·471
81 ... 85	129	2968·857	2616·143	88·120
86 ... 90	30	876·000	772·000	88·128
91 ... 95	3	2·000	...	...
Total .	48546	99577·853	71268·136	71·570

From this Table it will be seen that at advanced ages, when the more chronic forms of disease prevail, as shewn in pp. 169–99 *ante*, the ratio of "walking about" sickness is much increased. Between ages 21–50, the ratio is from 50 to 60 per cent., but above the age of 50, the ratio varies from 68 to 88 per cent., and on the average of all ages, the ratio of "walking about" sickness is 71·570 per cent. Consequently, when sick pay is regulated by this distinction, it must materially affect the liabilities of the societies, and in all such cases the data furnished in the preceding Table will be found valuable in the adjustment of the contributions and benefits. In like manner will the data of protracted sickness, given in Table NN, be found useful in the determination of the rates for societies in which the benefits are affected by the duration of the sickness.

It may not be without interest to direct attention, at this place, to the sickness experienced by one of the largest societies connected with the great railway interests of this country. The following Table shews the amount of sickness experienced by the Great Western Railway Friendly Society during the five years ending December 1851.

In the following Table it will be found that the total amount of sickness was 7189·429 weeks, while, according to the ratio of England and Wales generally, as given in Table V, p. 409, the amount of sickness would have been 6145·048 weeks only; but the feature to which attention is more particularly directed in the following Table is the relation of "full-pay" sickness to the total sickness. From this Table it appears that

Table PP.

Sickness experienced by the Great Western Railway Friendly Society—expressed in weeks.

Age.	Number of Years' Risk.	Total Sickness.	Full-Pay Sickness only.	Ratio per Cent. of Full-Pay Sickness to Total Sickness.	Sickness per annum to each Member.
21 to 25	1032·5	1061·286	1061·286	100·000	1·028
26 ... 30	2219·0	2274·857	2123·857	93·350	1·025
31 ... 35	2049·0	2279·572	1921·429	84·660	1·112
36 ... 40	817·5	974·142	811·999	83·355	1·192
41 ... 45	241·5	301·285	301·285	100·000	1·248
46 ... 50	56·0	112·001	112·001	1000·00	2·000
51 ... 66	17·5	186·286	33·857	18·175	10·645
Total . .	6433·0	7189·429	6365·714	88·545	1·115

the great bulk of the members of the society being under the age of 40, the "full-pay" sickness amounted, on the average, to no more than 88·545 per cent. of the whole sickness, the remainder or 11·455 per cent. being of the protracted character, which during the term of life 51–66 was 81·825 per cent. of all the sickness of that period.

Another interesting illustration of the character of the diseases producing temporary and permanent sickness, as well as "bed-lying" and "walking-about" sickness, is derived from the experience of the "Thistle and Rose" during the years 1841–8.

Table QQ.

Duration of Temporary and Permanent Sickness, distinguishing Bed-lying from Walking-about Sickness, from attacks of various classes of Disease—expressed in Weeks.

Class of Disease.	Number of Persons Sick.	Amount of Sickness expressed in Weeks.					
		Temporary.		Permanent.		Total amount of Sickness experienced.	Average amount of Sickness to each Person.
		Bed-lying.	Walking.	Bed-lying.	Walking.		
I. Zymotic Diseases	90	242·429	138·858	...	...	381·287	4·236
II. Dropsy, Cancer, and other Diseases of uncertain or variable seat . . .	10	68·859	6·000	...	...	74·857	7·486
III. Tubercular Diseases	16	28·429	80·571	...	7·571	116·571	7·286
IV. Diseases of the Brain, Spinal Marrow, Nerves, and other Senses . .	47	240·571	169·571	103·857	945·286	1459·284	31·048
V. Diseases of the Heart and Blood Vessels	5	61·714	22·714	6·857	28·286	119·571	23·914
VI. Diseases of the Lungs, and of the other Organs of Respiration . . .	72	297·287	126·572	230·571	114·143	768·573	10·925
VII. Diseases of the Stomach, Liver and other Organs of Digestion . .	43	103·571	130·000	...	...	233·571	5·432
VIII. Diseases of the Kidneys, &c. . .	3	23·571	11·714	...	...	35·285	11·762
X. Rheumatism, Diseases of the Bones, Joints, &c.	42	132·714	224·858	16·429	330·857	705·858	16·806
XI. Diseases of the Skin, Cellular Tissue, &c.	10	46·429	22·143	29·857	...	98·529	9·843
XIII. Debility	10	13·429	30·000	...	14·286	57·715	5·772
XVII. Violence, External Causes, Injuries, &c.	37	105·714	106·857	...	2·000	214·571	5·799
All Causes	385	1365·715	1069·858	387·571	1442·429	4265·572	11·079

The data, it will be observed, are not sufficiently numerous in the preceding Table to justify the insertion of the sub-divisions of each class of disease, but the results, as above given, are, notwithstanding, highly instructive on the question of protracted sickness. The classification of the diseases is the same as that followed in pp. 172-9, *ante*. The highest ratio of permanent and protracted sickness will be found in Class IV, Diseases of the Brain and Nervous System, and, as already pointed out in various parts of this Contribution, as well as in p. 183, *ante*, this class of disease is characteristic of the more advanced ages. Classes VI and X stand next in order with respect to permanent sickness, the principal invaliding being from Asthma in the former, and from Rheumatism in the latter. The last column of the preceding Table shews the average duration of temporary and permanent sickness in the aggregate, and it will be found that the various classes of disease stand in the following order in regard to the duration of the attacks of sickness, namely, IV, V, X, VIII, VI, XI, II, III, XVII, XIII, VII, and I, the zymotic class of disease shewing, as might be expected, the shortest duration of attack. The highest duration is 31·048 weeks, being in Class IV, Diseases of the Brain and Nervous System, the shortest, as just stated, in Class I, Zymotic Diseases, being 4·236 weeks, and the average of all is 11·079 weeks.

These facts it is believed are quite sufficient to point out the importance of protracted and permanent sickness being provided for in the pecuniary scheme of every properly constituted friendly society, and the danger attendant on the use of data from which elements so important have been excluded.

The following are the results of a combination of the elementary data of some interest, in a form not hitherto attempted, and from which some useful conclusions may be drawn. In the preceding Tables the rate of mortality has invariably been regarded in relation to every member of the society or societies, at the given ages; but in column 2 of the following Table will be found the results of a different combination. All the members, at every year of life, or rather all the members of exactly the same age, being placed in one group, the number of these that had actually experienced sickness during the course of that year of life was recorded. And these being abstracted from the total number of members of the same age, column 2 was deduced, expressing for quinquennial periods of life the per-centage of members that are actually sick in the course of one year; for example, out of every hundred members aged 31–35 in a society, twenty-one will be on the sick list during some part of the year; but of the same number of members aged 61–65, at least thirty-five members will be sick during some period or other of the year.

An inspection of column 2 will shew that, from the younger ages up to the period 31–35, the ratio or chance for any given member to be sick diminishes; but that from that period of life upwards, the tendency for any given member to be sick increases in a uniform and regular series. No Table of this kind has hitherto existed; and it is

believed, that in addition to the more general purposes of Vital Statistics, it will be practically useful to benefit societies, in enabling them to determine whether the numbers on their sick list be greater or less than the average. Table V will afford a means to determine whether the total amount of sickness in a society be greater than the average; but the present Table simply points out the proportion of members to be expected on the sick list, and is perhaps more important than the other, as a test of the means of selection adopted for the admission of members.

Column 3 is simply a modification of column 2, and needs no explanation further than to state, that it will afford a ready means of testing the relation of the sick to the non-sick members in any one year, when placed in separate groups, as is generally done in benefit societies.

TABLE RR.

Age.	Per-Centage of Members Sick during each Year.	Ratio of Sick Members to every 100 not Sick in every Year.	Mortality per Cent. among those Actually Sick.	Sickness per Annum among those Actually Sick.	Total Amount of Sickness to each Death.	Age.
11 to 15	21·9565	28·1337	·9901	4·1231	416·4290	11 to 15
16 ... 20	22·0743	28·3273	2·8571	3·5887	125·6032	16 ... 20
21 ... 25	22·0386	28·2686	3·0539	3·8518	126·1271	21 ... 25
26 ... 30	21·6997	27·7134	3·3271	4·1921	125·9977	26 ... 30
31 ... 35	21·0147	26·6058	3·7592	4·3585	115·9411	31 ... 35
36 ... 40	21·5471	27·4650	4·0686	4·9463	121·5732	36 ... 40
41 ... 45	22·9858	29·8463	4·5306	5·9418	131·1468	41 ... 45
46 ... 50	24·6042	32·6333	5·1657	6·8556	132·7123	46 ... 50
51 ... 55	27·6422	38·2022	6·2401	8·5104	136·3839	51 ... 55
56 ... 60	30·2424	43·3535	7·2732	10·9261	150·2235	56 ... 60
61 ... 65	35·5676	55·2015	8·6163	15·1975	176·3808	61 ... 65
66 ... 70	46·8493	88·1443	9·6004	24·2217	252·2988	66 ... 70
71 ... 75	58·3750	140·2400	12·1306	32·6275	268·9679	71 ... 75
76 ... 80	73·5916	278·6667	11·3636	36·2367	318·8876	76 ... 80
81 ... 85	74·4624	291·5790	18·4116	37·7633	205·1064	81 ... 85
86 ... 90	79·4872	387·5000	17·2043	41·0829	238 7943	86 ... 90
91 ... 95	50·0000	100·0000	...	39·2450	...	91 ... 95
96 ...100	...	...	...	...	...	96 ...100

In Tables E, F, and G, &c., the rate of mortality was given for the general population of friendly societies; but in the fourth column of the preceding Table will be found the mortality per cent. among those persons actually sick. The mortality among the population generally has been shewn to increase with age; so also does the mortality among those persons actually sick increase with age.

In the quinquennial period of life, 21–25, the mortality among those sick is 3·0539 per cent.; but in the advanced period of life, 66–70, the mortality is increased to 9·6004 per cent., or more than three times that of the other period. An inspection of this column will shew that there is a uniform and gradual increase of the rate of mortality.

Tables of this kind are calculated to throw important light on the subject of Vital Statistics. A chronological series would point out any change or modification that may have taken place in the intensity and severity of disease. By the aid of the information given in column 4, premiums may easily be determined for the assurance of lives while actually sick; but as the results in that column do not distinguish sickness under particular diseases, a knowledge of the disease under which the patient might be suffering would be of no assistance to parties undertaking the risk: but if particular diseases, with the sickness and mortality under each, were given in separate classes, then the results would apply to given diseases, in the same manner in which the above results will apply to sickness in general, irrespective of disease. An application of columns 2 and 4 will afford the means of measuring the exact liabilities of a friendly society; and if the same means were available to an assurance company of ascertaining the ratio of its members sick, the principles of determining the liabilities in those companies would undergo an important change.

Suppose that any particular society contains 3647 members, equally distributed over the ten quinquennial terms of life, from 20 to 70 years of age, one thousand of them would be found on the sick list in the course of a year, and of one thousand persons found sick, fifty-six deaths would take place in that year; but if in the actual result the balance of those numbers was in any way disturbed, that circumstance would tend to shew whether the selection of lives in the society was of a favourable or unfavourable character.

The results in column 4 were obtained by direct observation; but it is evident that if m is made to represent the rate of mortality per cent. as given in Tables E and F, and a the results in column 2, then

$$\frac{m \times 100}{a} = \text{column 4.}$$

It is obvious that in applying the results in this Table to any practical purpose, independent calculations must be made for each term of years, otherwise errors of the same nature as those pointed out at page 45 would affect the result.

Column 5 of the same Table will be found to represent the amount of sickness per annum among those actually sick. From the age of 15 upwards, the amount of sickness will be found to increase in a regular and uninterrupted series. At the term of life, 21–25, there is 3·8518 weeks' sickness in a year to each person, but at the term 66–70 there is 24·2217 weeks' sickness to each person actually sick.

Without any further inquiry on this point, the manner in which it will bear on what is called permanent sickness in friendly societies is obvious. It will thus be seen, that not only have advanced years a greater liability to sickness, but that, once on the sick list, its duration receives a most remarkable increase. It will also be further seen, that at the

two terms of life, 21–25 and 66–70, the relative chances of being sick are in the ratio of 220 to 468, while the mortality at the same terms of life is in the ratio of 31 to 96 among those actually sick; and that the amount of sickness to those persons at the respective ages, shews the remarkable disparity of 39 to 242.

The cares, anxiety, and suffering with which the decline of life is thus beset, appear to form a most striking contrast to the improvident carelessness with which, in youth, any provision for those calamities is regarded. "If any man will not work, neither shall he eat;" and as "the time cometh when no man can work," it is in the summer of life that abundant provision must be made for the vicissitudes of that winter which incapacitates for labour; but how mortifying must be the disappointment which falls on the hopes of those patient contributors to friendly societies, who, after thirty or forty years' experience, find, in the decline of life, when thrown by their infirmities on those societies for support, no brighter prospect than the severe and harassing privations of pauperism, or the consolations of a workhouse.

The results of column 5 may be obtained in the same manner as that just described for column 4, viz.:—Let s represent the average sickness per annum, as given in Tables E and V, and a the results in column 2; then

$$\frac{s \times 100}{a} = \text{column 5.}$$

It must be kept in view, that the results in this column, as well as those given in the whole of the Table, will be much influenced by local circumstances and peculiarity of employment, and that it is not to be thought that they can be applied with safety to all societies promiscuously. Considerable experience and discrimination will always be required, to determine the due application of many of the most important practical results here presented.

Perhaps the most curious and interesting part of the preceding Table is column 6, as it presents some remarkable and novel features connected with Vital Statistics. A careful survey of the figures presented will shew, that although, as age advances, the human constitution has a greater tendency to decay, and greater liability to sickness, still it presents the apparent anomaly of having, in advanced life, a greater power of enduring sickness than in younger life; and that, although there is less power to resist the approach of disease, there is a higher capability of sustaining its insidious and destroying agency.

At the period of life 31–35, it will be seen that for every 116 weeks of sickness there is one death; but at the term of life 66–70, there is only one death for 252 weeks of sickness; or in other words, a greater amount of sickness is required to destroy life at advanced ages than at younger ages.

This peculiar feature, which seems to have been unexpected by those giving attention to such subjects, may be explained in several ways. Many of the diseases prevalent in younger life disappear in after years; and, in passing from the diseases peculiar to youth, other diseases ensue, which, although not so acute in their nature, are yet fatal in their results; and thus the change from the acute to the more chronic form of disease will impart increased duration, but not severity, to the sick-list of a society. Again, many fatal diseases of youth, such as Consumption and other Diseases of the Chest, do not, to any great extent, incapacitate from labour; and in those diseases the mortality may be high, while the amount of sickness is small.

Nothing like a proper enumeration of all the practical applications of the preceding Table is here contemplated; but it may not be out of place to refer to a few of the more obvious uses to which it may be applied. In friendly societies, a correct record of the amount of sickness among the members will afford the means of predicting the number of deaths to be looked forward to, as well as the class of members among which such deaths are most to be expected. Investigations into the affairs of a society will also be much aided by a skilful survey of the relative amount of sickness to the deaths among the members. Provided that, over a sufficiently long period, an unusually large amount of sickness was found to prevail in relation to the number of deaths, it might be safely inferred that some peculiar element affected the results; but if both sickness and mortality should shew a marked augmentation beyond the calculated numbers, then such a feature might be regarded as evidence of an inferior condition of health among the members of that society. For the more important purposes of medical science, the results in column 6 are easily available. Perhaps no simpler numerical test could be offered of the efficiency of particular modes of treatment; but to apply the results here given with much success, the figures should have been classified according to the sickness and mortality of particular diseases. A portion of the elementary data will admit of such a classification; and it is intended to publish the results on some future occasion.

Suppose a medical practitioner to have within the circle of his patients one thousand persons, whose ages vary from 21 to 70 years, and equally spread over that term of life; according to the results here given, he ought to expect 274 of them to be on his sick list during the course of a year—that they would experience 2430 weeks' sickness in the aggregate—and that there would be about sixteen deaths out of that number in the same time; and presuming that he were to visit each patient every alternate day, it would produce 8505 visits in the course of a year, or about 23 visits daily. Societies and many other public bodies adopt a practice of paying an annual sum for medical attendance and advice; and it will thus be seen that means are available by which to calculate the probable amount of labour and time that may be required for the discharge of such engagements.

A few years since, in order to satisfy some speculations on the subject of Scrofula,

then under investigation by Mr. Phillips in the preparation of his distinguished Treatise on the Nature, Causes, and Prevalence of that disease, and also with the view of elucidating some points of an interesting inquiry, which was conducted about the same time by Dr. Guy of King's College, a combination was made of the data on which this contribution is founded, so as to exhibit the sickness and mortality of factory occupations, of in-door occupations requiring great exercise, and of the same occupations requiring little exercise, and also of out-door occupations requiring great exercise, and of the same occupations requiring little exercise. The classification of in-door and out-door occupations was intended to exhibit the difference, if any, due to fresh and pure air in contrast with that of impure air inhaled in confined places, and the further analysis of distinguishing between great and little exercise was intended to satisfy the requirements of certain conditions appearing in the results arrived at in pp. 1–66 *ante*. The following Table contains the results for factory occupations.

Table S S.

Mortality and Sickness amongst Factory Occupations.—Rural Districts, Towns, and Cities.—Sickness expressed in Weeks.

Age.	Population.	Deaths.	Mortality per Cent.	Total Sickness.	Sickness per Annum = (*a*.)	Σ (*a*.)	Sickness per Annum Table E, data for England, = (*b*.)	Σ (*b*.)
10 to 15	285	...	...	385·425	1 352		·7530	
16 ... 20	1443	29	2·010	2334·140	1·618		·8288	
21 ... 25	3279	29	·884	2187·856	·667	1·416	·8564	1·7578
26 ... 30	4989	30	·601	3736·139	·749		·9014	
31 ... 35	5820	61	1·048	7020·138	1·206	3 035	·9248	3·7544
36 ... 40	5759	47	·816	8138·705	1·413		1·0718	
41 ... 45	5509	32	·581	6368·852	1·156	5·752	1·3443	6·8172
46 ... 50	5131	58	1·130	8009·137	1·561		1·7185	
51 ... 55	4080	72	1·765	10023·137	2 457	12·111	2·3231	12·4176
56 ... 60	3189	97	3·042	12444·140	3·902		3·2773	
61 ... 65	2078	62	2·984	11945·426	5·749	26·877	5·4983	29·0438
66 ... 70	1384	62	4·480	12480·140	9·017		11·1279	
71 ... 75	691	81	11·722	11668·708	16·887	79·620	18·4056	73·5060
76 ... 80	304	24	7·895	10900·140	35 856		26·0566	
81 ... 85	130	6	4·615	5299·427	40·765		28·2665	
86 ... 90	71	5	7·042	2953·715	41·602			
91 ... 95	19	...	...	208·000	10·947			
Total. .	44161	695	1·574	116103·225	2·629			

Taking the whole range of the two classes of data compared in the preceding Table, no very decided or striking differences will be found. Under the age of 20, the sickness amongst the factory trades is high; in the next decennium, very low; and thence onward, sometimes higher and sometimes lower than for the whole of England and Wales. If the summation columns, Σ, be compared, it will be seen that the aggregate sickness in factory occupations, between ages 21–60, is nearly the same as that for England and Wales generally, and over the more extended period of life, 21–70, the sickness is less than in the country generally. After the age of 70, the numbers are too small to warrant comparison. This Table will be very useful as affording a test of the condition of health amongst those actively employed in this great branch of national industry. Those curious about the views which medical inquirers take of the results indicated in column 4, will be interested by a perusal of chapter IX in Mr. Phillips's Treatise on Scrofula.

In the next place, attention is directed to the results of the combinations shewn in the following Tables, T T and V V, the former shewing the mortality and sickness of in-door occupations requiring little exercise, and the latter requiring great exercise.

Table T T.

Sickness and Mortality amongst In-door Occupations requiring little exercise.—The Sickness expressed in Weeks.

Age.	Population.	Deaths.	Mortality per Cent.	Total Sickness.	Sickness per Annum.
10 to 15	77	...	...	36·999	·481
16 ... 20	708	5	·706	851·285	1·202
21 ... 25	3418	29	·849	2702·857	·791
26 ... 30	6062	53	·874	4991·713	·823
31 ... 35	6894	59	·856	6056·571	·879
36 ... 40	6503	59	·907	7032·428	1·081
41 ... 45	5132	52	1·013	5738·857	1·118
46 ... 50	4224	47	1·113	4461·713	1·056
51 ... 55	3003	60	1·998	6429·427	2·141
56 ... 60	2361	56	2·372	7589·000	3·214
61 ... 65	1399	51	3·646	7297·141	5·216
66 ... 70	882	44	4 989	9532 000	10·807
71 ... 75	486	39	8·025	8805·714	18 119
76 ... 80	202	20	9·901	6025·284	29·828
81 ... 85	64	16	25·000	1889·857	29·529
86 ... 90	26	4	15·384	746·286	28·703
91 ... 95	5	1	20·000	14·000	2·800
96 ...100	1	...	...	...	...
Total . .	41447	595	1·436	80201·132	1·935

Table V V.

Sickness and Mortality amongst In-door Occupations requiring great exercise.—The Sickness expressed in Weeks.

Age.	Population.	Deaths.	Mortality per Cent.	Total Sickness.	Sickness per Annum.
10 to 15	21	...	...	33·000	1·571
16 ... 20	408	1	·245	251·855	·617
21 ... 25	1954	11	·563	1132·714	·580
26 ... 30	3599	33	·917	2941·571	·817
31 ... 35	4315	41	·950	3240·428	·751
36 ... 40	3833	48	1·252	3878·426	1·012
41 ... 45	3141	35	1·114	3806·715	1·212
46 ... 50	2602	45	1·729	4693·857	1·804
51 ... 55	1751	35	1·999	2893·713	1·653
56 ... 60	1293	32	2·475	4137·857	3·200
61 ... 65	728	24	3·297	3936·857	5·408
66 ... 70	392	23	5·867	4253·143	10·850
71 ... 75	208	14	6·731	4609·715	22·162
76 ... 80	65	6	9·231	1421·571	21·870
81 ... 85	39	2	5·128	1276·571	32·733
86 ... 90	9	2	22·222	218·000	24·222
Total . .	24358	352	1·445	42725·993	1·754

The necessity of economising space, to prevent this volume growing to inordinate dimensions, will prevent Tables of Decrements from being given of the mortality in the two preceding and the two following Tables; but the next Abstract of the expectation of life for a few ages will serve to give a very correct idea of the relative degrees of mortality in the four classes of occupations now under consideration.

Age.	Expectation of Life in			
	In-door Occupations with		Out-door Occupations with	
	Little Exercise.	Great Exercise.	Little Exercise.	Great Exercise.
20	41·8822	42·0133	37·8017	43·4166
30	35·1170	34·5022	30·1435	36·5832
40	27·9113	27·8004	23·0357	29·1284
50	20·5022	21·1805	17·2754	21·9732
60	14·0430	15·1413	11·0169	15·5635
70	8·6490	10·4407	4·5607	9·3313

This Abstract is full of interest as to the effect of occupations on health. It will be observed that in regard to In-door occupations, the expectation of life differs little until after age 40, and then there is a decided difference in favour of the occupations requiring great exercise: but in respect to the Out-door occupations, the section requiring little exercise exhibits a most remarkable inferiority in the value of life. The results are certainly very striking, and are calculated to throw much light on many obscure and vexed questions connected with inquiries made into the sanitary condition of our large towns. These results are strongly corroborative of some of the observations made in the early part of this volume, and viewed in conjunction with the data contained in pp. 17–101 support the opinion that differences in occupations of the people have a greater influence on the mortality than any peculiarity due to differences in locality, the drainage of towns, or the ventilation of dwellings. The expectation of life in the section of Out-door occupations requiring little exercise is not only remarkably below that of the Out-door occupations with great exercise, but is actually less than either of the In-door sections, and is even 20 per cent. less than the In-door section with little labour. An extension of this branch of the inquiry would probably shew that concomitant with Out-door labour requiring little exercise, there may be peculiarities of personal habits not essential to the occupation itself; (as shewn in the preceding Contribution on intemperate lives,) which may to some extent account for the high rate of mortality.

The following Tables shew the rate of mortality and sickness at each term of life, for the two sections of Out-door occupations.

Table W W.

Sickness and Mortality amongst Out-door Occupations requiring little exercise.—The Sickness expressed in Weeks.

Age.	Population.	Deaths.	Mortality per Cent.	Total Sickness.	Sickness per Annum.
10 to 15	4	...	...	22·000	5·500
16 ... 20	103	...	...	54·571	·530
21 ... 25	520	3	·577	589·713	1·134
26 ... 30	1096	9	·821	861·000	·786
31 ... 35	1486	14	·942	1281·141	·862
36 ... 40	1237	16	1·294	1179·428	·954
41 ... 45	984	21	2·134	1661·142	1·688
46 ... 50	703	16	2·276	996·856	1·418
51 ... 55	455	14	3·077	877·571	1·929
56 ... 60	331	6	1·813	1010·001	3·051
61 ... 65	170	7	4·118	660·285	3·884
66 ... 70	98	5	5·102	1364·857	13·927
71 ... 75	30	7	23·333	388·143	12·938
76 ... 80	26	7	26·923	492·143	18·929
81 ... 85	3	...	...	78·000	26·000
86 ... 90	4	1	25·000	148·000	37·000
Total .	7250	126	1·738	11664·851	1·609

Table Y Y.

Sickness and Mortality amongst Out-door Occupations requiring great exercise.—The Sickness expressed in Weeks.

Age.	Population.	Deaths.	Mortality per Cent.	Total Sickness.	Sickness per annum.
10 to 15	28	...	...	13·000	·464
16 ... 20	576	4	·694	497·856	·864
21 ... 25	2648	20	·755	2124·856	·802
26 ... 30	4592	41	·893	4212·429	·917
31 ... 35	5475	34	·621	4411·857	·806
36 ... 40	5425	50	·922	5784·999	1·066
41 ... 45	4407	36	·817	4665·571	1·059
46 ... 50	3510	54	1·538	4065·857	1·158
51 ... 55	2613	48	1·837	5083·999	1·946
56 ... 60	1881	39	2·073	4880·000	2·594
61 ... 65	1215	31	2·551	4882·714	4·019
66 ... 70	791	30	3·793	8396·714	10·615
71 ... 75	346	23	6·647	6387·428	18·461
76 ... 80	179	18	15·126	5075·284	42·649
81 ... 85	64	7	10·938	1775·143	27·737
86 ... 90	32	4	12·500	1040·143	32·505
91 ... 95	4	...	...	208·715	52·179
Total . .	33786	439	1·299	63506·565	1·880

In order to obtain a better view of the general results as to sickness, in not only the two preceding Tables, but also in Tables T T and V V, the following Abstract has been prepared.

Sum of the rate of Sickness per annum at each quinquennial term of life—expressed in Weeks.

Age.	In-door Occupations with		Out-door Occupations with		England and Wales, Three Districts.
	Little Exercise.	Great Exercise.	Little Exercise.	Great Exercise.	
21 to 30	1·614	1·397	1·920	1·719	1·758
21 ... 40	3·574	3·160	3·736	3·591	3·754
21 ... 50	5·748	6·176	6·842	5·808	6·817
21 ... 60	11·103	11·029	11·822	10·348	12·418
21 ... 70	27·126	27·287	29·633	24·982	29·044

As already stated in respect to the sickness of the In-door occupations, it will be seen that there is in the term of life 21–70 scarcely any difference between the two sections, but in regard to the Out-door occupations requiring little exercise, the same remarkable distinction which characterised the mortality is also observable in the sickness. The rate of sickness is very much in excess of any of the other sections. This is a most important circumstance, not only as affecting friendly societies, but other matters of public interest.

In vol. II. of "The Journal of the Statistical Society" will be found an interesting report by a committee of that society upon the sickness and mortality among the Metropolitan Police Force, during the eight years ending the 31st of December, 1838, being the eight years immediately succeeding the embodiment of that force in the year 1830. The committee in their report have given four very interesting Tables; but the following Table Z Z has been constructed from the original data in a different form from any of those furnished by the committee.

From column 3 it will be seen that the average force for the whole period of eight years was 3313, and the numbers were very nearly stationary during the whole of that period; but it is stated that it was found necessary to recruit annually as many as 1100 new members, the vacancies being created by 1068 who were removed or retired from the force, and 32 who died every year. From the institution of the force to the 31st December, 1838, no less than 14,548 had entered it, and the following shews the proportion entering at various ages:—

32·0	per cent. admitted under age		26,
37·5	...	from age	26 to 31,
21·6	...	...	31 to 36,
6·3	...	...	36 to 41,
2·6	...	above	41.

The ratios of removed and retiring at the corresponding ages were very nearly the same. The average duration of the service of each policeman was consequently about three years, and the average age on admission 28·5 years, and it will be further observed that 69·5 per cent. of all the men entered the force between ages 20 to 31.

The average mortality has been nearly one per cent., or a little under that for the population of England and Wales generally, as given in Table C, but very much greater than that found to prevail in friendly societies, as shewn in Table F, page 32. Attention is now directed to this Table, in consequence of the data forming a marked instance of a class of men undergoing a great amount of bodily labour in the open air. It is stated that each individual of the Police Force has to walk twenty miles every day in going his rounds; besides being obliged to attend charges at the police offices, estimated as equal to an additional five miles, making in all twenty-five miles a day. During two months

[out of every

Table Z Z.

Shewing the number of Weeks' Sickness among each Division of the Metropolitan Police Force for each Month during the Eight Years ending the 31st December, 1838.

District.	Total Number of the Police Constables during Eight Years.	Average Number per Annum.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Sickness during the Eight Years.	Average Sickness per annum per man.
A Whitehall . .	937	116	89·714	53·286	64·286	92·143	67·429	69·714	60·429	67·714	74·714	68·417	69·143	94·857	871·857	0·9405
B Westminster .	1304	163	134·286	90·571	102·429	128·143	98·571	86·000	89·429	107·000	103·429	93·571	123·571	113·714	1270·714	0·9745
C St. James's .	1469	184	224·429	174·143	187·714	202·286	179·000	151·857	148·143	163·429	157·143	158·286	177·571	173·429	2097·429	1·4278
D Marylebone .	1290	161	219·286	194·286	172·857	210·143	142·143	144·429	151·571	179·429	187·429	178·857	182·429	227·143	2190·000	1·6977
E Holborn . .	1304	163	262·143	185·286	192·571	206·286	175·286	182·714	198·857	246·857	226·714	144·143	160·571	200·857	2382·286	1·8270
F Covent Garden	1270	159	243·714	165·714	147·429	175·286	145·857	142·571	189·714	169·000	157·571	171·143	171·571	195·714	2075·286	1·6341
G Finsbury . .	1840	230	382·143	293·857	267·286	326·857	275·286	241·429	217·571	235·429	263·571	279·714	270·000	302·286	3355·429	1·8236
H Whitechapel .	1480	185	197·286	134·429	128·286	160·286	138·143	141·429	165·143	170·143	142·571	156·286	164·143	181·286	1879·429	1·2699
K Stepney . .	2320	290	386·286	261·286	297·286	287·429	272·143	249·286	257·714	307·286	263·286	266·857	343·714	347·714	3540·286	1·5260
L Lambeth . .	1487	186	225·143	162·571	176·571	201·857	145·000	157·714	137·143	164·857	167·571	163·286	180·286	209·429	2091·429	1·4065
M Southwark . .	1472	184	267·000	178·143	189·571	218·571	161·857	163·714	141·286	168·714	167·571	179·143	209·286	253·571	2298·429	1·5614
N Islington . .	2148	269	406·143	282·857	244·571	281·857	241·714	199·286	224·286	229·714	192·571	237·714	268·000	334·857	3143·571	1·4681
P Camberwell .	1900	238	324·571	242·000	230·857	269·714	215·857	168·143	192·143	206·286	197·714	221·571	241·714	223·143	2733·714	1·4388
R Greenwich . .	1656	207	315·000	209·714	197·000	200·857	166·857	170·571	178·429	244·143	205·714	217·857	189·571	235·857	2531·571	1·5287
S Hampstead .	1751	219	359·571	302·857	280·286	275·571	186·000	195·714	203·143	226·714	229·714	239·000	291·571	295·714	3085·857	1·7623
T Kensington .	1439	180	161·286	126·857	140·286	136·429	94·571	74·143	103·286	117·286	91·000	125·714	118·000	100·429	1389·286	0·8655
V Wandsworth .	1450	181	233·571	176·286	200·714	196·857	152·857	30·857	132·857	156·857	144·143	145·857	145·286	141·714	1957·857	1·3502
Total. . .	26507	3313	4431·571	3234·143	3220·000	3570·571	2858·571	2569·571	2791·143	3160·857	2972·429	3047·429	3306·429	3631·714	38794·429	1·4636
Average. .	...	...	553·946	404·268	402·500	446·321	357·321	321·196	348·893	395·107	371·554	380·929	413·304	453·964	4849·304	

out of every three each police constable was on night duty for nine hours each night, from nine o'clock in the evening to six o'clock in the morning, which must be considered excessive; and from the results given in Table Z Z is evidently detrimental to health. On referring to the last column of this Table it will be seen that the average amount of sickness was 1·4636 weeks to each member of the force, while according to Table V, the results for the City Districts should not have exceeded 1·100 per cent., and for the average of the three districts combined not more than 0·910 per cent.

It will be seen from an inspection of the results in the last columns of this Table that the rate of sickness has differed widely in the various divisions of the force. In the Kensington division the sickness per annum was only 0·8655 weeks per annum to each member, while, in the Holborn division, the sickness was as high as 1·8270 weeks yearly. In pages 166–8 *ante*, will be found several interesting illustrations of the effect of the various seasons of the year on the amount of mortality, and the Table now under consideration furnishes important information on the influence which the different seasons of the year have on the amount of sickness. Nearly the whole of the Police Force was under the age of 40, and therefore the results in Table Z Z should be compared with those in the second column of the first Abstract in page 168 *ante*.

	Mortality (see page 168).	Sickness (see Table ZZ).
Quarter of least Mortality and Sickness	April, May, June.	June, July, May.
Quarter, second in intensity.	July, August, September.	September, October, August.
Quarter, third in intensity	January, February, March.	March, February, November.
Quarter of highest Mortality and Sickness	October, November, December.	April, December, January.

Considering all the circumstances as to time and place, and that the one series of observations relate to Mortality, and the other to Sickness only, there is a much greater correspondence between the two classes of results than might have been expected. Table ZZ will be useful in illustrating the marked fluctuations due to the seasons of the year in the different districts of the Metropolis, and it has an important public interest on many questions now pending as to the efficiency of the Police Force, and the trying nature of the duties the members of that force are called on to discharge. A service in which the members cannot remain on the average, more than three years, must be really very irksome and laborious, and if recent facts confirm the results of the eight years' experience embodied in Table ZZ, greater credit is due to those connected with the Metropolitan Police Force than the public in its present temper seems disposed to accord to them.

For the purpose of a medical inquiry conducted by Mr. Maclaren two or three years since, it was thought important to make a similar investigation to that, the results of which are given in pp. 454–8 *ante*, into the effect of sedentary occupations on female life, and the next Table exhibits the results arrived at.

Table AB.

Sickness and Mortality amongst Female Occupations according to the data described in pp. 17-9 ante—The Sickness expressed in Weeks.

Age.	Active Occupations:— Charwomen and Washerwomen, Cooks, Domestic Servants, Housewives, Laundresses, &c.					Sedentary Occupations:— Dressmakers, Lacemakers, Milliners, Sempstresses, Shoe-binders, Straw-bonnet-makers, &c.				
	Population.	Deaths.	Mortality per Cent.	Sickness.	Sickness per Annum.	Population	Deaths.	Mortality per Cent.	Sickness.	Sickness per Annum.
16 to 20	958	9	·939	807·989	·843	913	9	·986	1217·713	1·334
21 ... 25	2469	16	·648	2841·987	1·151	1577	16	1·015	2826·420	1·792
26 ... 30	3087	33	1·069	5654·562	1·832	1127	12	1·065	2423·564	2·150
31 ... 35	2958	11	·372	4746·987	1·605	813	8	·984	990·423	1·218
36 ... 40	2858	12	·420	3804·136	1·331	491	8	1·629	890·998	1·815
41 ... 45	2602	32	1·230	4080·420	1·568	414	7	1·691	665·424	1·607
46 ... 50	2100	30	1·429	3858·570	1·837	323	4	1·238	1541·283	4·772
51 ... 55	1861	20	1·075	3259·287	1 751	209	6	2·871	829·854	3·971
56 ... 60	1354	26	1·182	2560·569	1·891	66			23·570	·357
61 ... 65	747	17	2·276	2079·568	2·784	25			40·000	1·600
66 ... 70	325	9	2·769	2580·000	7·938	9			10·000	1·111
71 ... 75	102	7	6·862	3431·000	3·363	19			12·000	·632
Total .	21421	225	1·050	39705·075	1·853	5986	70	1·169	11471·249	1·916

The following is a condensed Abstract of the sickness shewn in the preceding Table, from which it appears that until above 60 years of age the sickness of both sections of occupation is in excess of that of the males for the whole of England and Wales. Beyond the age of 60, the facts in the preceding Table are not sufficiently numerous to admit of comparison. It will be further seen in the following Abstract, that the sickness in the sedentary occupations is greatly in excess of that in the others.

Female Trades.

Sum of the rate of Sickness per Annum at each quinquennial term of life —expressed in Weeks.

Age.	Active Occupations.	Sedentary Occupations.	England and Wales.
21 to 30	2·983	3·942	1·758
21 ... 40	5·919	6·975	3·754
21 ... 50	9·324	13·354	6·817
21 ... 60	12·966	17·682	12·418

In relation to the ratio of sickness amongst female lives generally, without distinction of occupation, it is necessary to make some observations.

In many societies, such as the Essex, the Wilts, and others, the rate of sickness which prevails among the female members greatly exceeds that among the other sex. On the other hand there are other societies, such as the Female Society at Mold, established by Archdeacon Clough, in which the sickness is remarkably below the average rate for males generally in benefit societies. However, in the materials furnished in connection with the inquiry which gave rise to this Contribution, the results for female life shewed in the aggregate, a somewhat higher rate of sickness than the ratio for male lives, although falling much below the rate shewn in the Essex and the Wilts Societies. The following Table shews the results for female lives for the whole of England and Wales as compared with the corresponding results for the male sex.

TABLE A C.

Sickness in England and Wales according to the data described in pp. 17-9 *ante—expressed in weeks.*

Age.	Females.			Males.	Difference per Cent.	Age.
	Number of Years exposed to risk.	Total amount of Sickness in Weeks.	Average Sickness.	Average Sickness.		
10 to 15	19	13·000	·6842	·7530	— 9·137	10 to 15
16 ... 20	504	278·143	·9149	·8288	+ 10·388	16 ... 20
21 ... 25	3140	2590·424	·8250	·8564	— 3·662	21 ... 25
26 ... 30	8852	9467·855	1·0693	·9014	+ 18·626	26 ... 30
31 ... 35	11538	14323·713	1·2415	·9248	+ 34·245	31 ... 35
36 ... 40	10828	14907·566	1·3786	1·0718	+ 28·625	36 ... 40
41 ... 45	10058	15131·282	1·5044	1·3443	+ 11·909	41 ... 45
46 ... 50	8639	15501·424	1·7944	1·7185	+ 4·417	46 ... 50
51 ... 55	7423	21419·137	2·8720	2·3231	+ 23·628	51 ... 55
56 ... 60	7080	19033·710	2·6884	3·2773	— 17·969	56 ... 60
61 ... 65	4929	16413·859	3·3301	5·4983	— 39·435	61 ... 65
66 ... 70	3076	13061·852	4·2464	11·1279	— 61·839	66 ... 70
71 ... 75	1488	15182·424	10·2032	18·4059	— 44·567	71 ... 75
76 ... 80	668	9611·849	14·3889	26·0566	— 44·779	76 ... 80
81 .. 85	277	4727·855	20·8276	28·2565	— 26·317	81 ... 85
86 ... 90	88	1794·712	20·3943	32·4940	— 37·238	86 ... 90
91 ... 95	16	328·000	20·5000	22·9714	— 10·759	91 ... 95
Total .	78623	173786·805	2·2104			

In the Wilts Society the sickness amongst female lives exceeds that of the other sex about 50 per cent., and the following gives the ratio for the Essex Provident Society:—

Table A D.

Sickness in the Essex Provident Society.

Age.	Females.			Males.	Difference per Cent.	Age.
	Number of years which Members have been exposed to risk of sickness.	Total Amount of Sickness experienced expressed in weeks.	Average number of weeks' sickness to each Member yearly.	Average number of weeks' sickness to each Member yearly.		
21 to 25	364·5	536·386	1·471	1·291	+13·943	21 to 25
26 ... 30	437·5	1084·858	2·480	1·346	+84·250	26 ... 30
31 ... 35	369·0	967·571	2·622	1·439	+82·210	31 ... 35
36 ... 40	327·5	789·999	2·412	1·534	+57·236	36 ... 40
41 ... 45	242·0	416·858	1·723	1·712	+ 0·643	41 ... 45
46 ... 50	152·5	188·428	1·236	1·821	−32·135	46 ... 50
51 ... 55	73·0	307·715	4·215	3·229	+30·536	51 ... 55
56 ... 60	36·5	58·430	1·601	4·869	−67·112	56 ... 60
61 ... 65	15·0	29·143	1·943	4·126	−52·908	61 ... 65
66 ... 70	3·5	21·286	6·082	15·969	−61·914	66 ... 70
Total . .	2021·0	4400·674	2·177			

The following Abstract of the two preceding Tables sufficiently shews that in female life, as well as in male life, the rate of sickness differs very widely: and the remarks made in respect to male life are, to a great extent, applicable to female life also, but from the recorded experience of the latter sex being more limited, the practical application of the results is rendered more difficult.

Table A E.

Rate of Sickness in the Essex Provident Society, and in the Friendly Societies of England and Wales generally.

Females.

Age.	Essex Society.	England and Wales.	Difference per Cent.
21 to 25	1·471	0·825	+ 78·303
26 ... 30	2·480	1·069	+132·000
31 ... 35	2·622	1·242	+111·111
36 ... 40	2·412	1·379	+ 74·909
41 ... 45	1·723	1·504	+ 14·561
46 ... 50	1·236	1·794	− 31·104
51 ... 55	4·215	2·872	+ 46·762
56 ... 60	1·601	2·688	− 40·439

Having thus brought under consideration these facts in regard to the experience of females, it is unnecessary to follow them up with any remarks on this particular question, further than simply to caution the promoters of benefit clubs against the indiscriminate use of these materials by societies which admit female members.

While these sheets have been passing through the press I have received a copy of some notes on the Mortality and Sickness found to prevail amongst the Ancient Order of

Foresters, compiled from Returns for the three years 1850–2, obtained from the various Courts of that Order. They have been analysed by Mr. William Watkins, P.C.R., of Court "Star of Sussex," No. 1914, Brighton. In this publication by the Ancient Order of Foresters there are many points of interest to which reference might be made if there were sufficient space remaining for that purpose, but it will now be impossible to do more than give the following condensed Abstract of the results.

TABLE AF.

Sickness according to the records of the Ancient Order of Foresters, for the Years 1850–2.

Age.	Number liable to Sickness.	Total Number of Days' Sickness stated to have occurred.	Sickness to each person in		Age.
			Days.	Weeks.	
20	578	2720	4·706	·672	20
21 to 25	2758	15417	5·590	·799	21 to 25
26 ... 30	4281	28367	6·626	·947	26 ... 30
31 ... 35	4073	25639	6·295	·899	31 ... 35
36 ... 40	3862	29705	7·692	1·099	36 ... 40
41 ... 45	2900	23593	8·136	1·162	41 ... 45
46 ... 50	2219	21079	9·499	1·357	46 ... 50
51 ... 55	1068	14543	13·617	1·945	51 ... 55
56 ... 60	551	8564	15·543	2·220	56 ... 60
61 ... 65	174	3737	21·477	3·068	61 ... 65
66 ... 70	146	3096	21·203	3·029	66 ... 70
Total . .	22610	176460	7·805	1·115	Total.

From this Table it will be seen that until age 40 the sickness of the Foresters is quite as high as the rates in Table E, from age 40 to 50 somewhat less, but after the age of 50 the data are of so limited extent as to be wholly inapplicable. These data are of very meagre extent compared with those of the Odd Fellows, but it is most satisfactory to find that the Order is now so alive to its interests as to enforce such an investigation into its affairs as must necessarily have taken place in carrying out this inquiry. It is quite impossible that it can result otherwise than in the most beneficial results. Whenever sufficient attention is drawn to the nature and extent of the liabilities of the Order by the publication of its own experience, members will ponder over them and eventually approve of such measures as are calculated to place the Order on a good and sound financial basis.

For many purposes it is important to know the ratio of persons constantly sick, in a society or particular district. In the following Table the figures in the second column are deduced from Table E, pp. 26–7, and represent the ratio of persons constantly

sick for the whole of England and Wales. The figures in the second column will of course follow the same law as those in Table E itself.

Table A G.

Ratio constantly Sick at various terms of Life.

Age.	Number per Cent. constantly Sick.	Number of Males continually Sick in England and Wales.		Age.
		1841.	1851.	
11 to 15	1·4481	12739·40	14003·23	11 to 15
16 ... 20	1·5938	12447·05	14133·99	16 ... 20
21 ... 25	1·6469	22531·85	23932·38	21 ... 30
26 ... 30	1·7335			
31 ... 35	1·7785	19178·80	22406·08	31 ... 40
36 ... 40	2·0611			
41 ... 45	2·5852	22042·94	25698·57	41 ... 50
46 ... 50	3·3048			
51 ... 55	4·4675	26735·18	32527·61	51 ... 60
56 ... 60	6·3025			
61 ... 65	10·5736	52688·58	59265·95	61 ... 70
66 ... 70	21·4000			
71 ... 75	35·3960	67414·13	74489·71	71 ... 80
76 ... 80	50·1088			
81 ... 85	54·3587	24084·54	23624·75	81 ... 90
86 ... 90	62·4885			
91 ... 95	44·1758	1319·09	1338·53	91 ... 95
96 ...100				

From the third column of the preceding Table, it will be seen that of the male population above 10 years of age, 261182 or 4·5257 per cent. were constantly sick in 1841, and from the fourth column it will be found, that taking the population as given in the census of 1851, there must have been in that year 291421 constantly sick above 10 years of age, or on the average 4·4325 per cent. constantly sick. There are many important applications which may be made of this Table, but its construction is so simple that the ratios according to any other classes of data may be easily deduced.

At this place it may be again stated, that in applying the preceding results to individual classes, or in a few instances only, it should not be expected that they will in every case be confirmed. Nothing short of a refined classification is calculated to meet the peculiar aspect of all the cases presenting themselves. A review of Table V will shew the wide distinction which prevails between the ratio of sickness in the Rural, Town, and City Districts; and in particular trades or occupations the amount of sickness is sometimes double that in other employments. In sickness, therefore, as well as in mortality, it is obvious that general results can be but of little practical value. Suppose

it were attempted to conduct societies in Liverpool, or in any other large city in England, on the terms that would be adequate for societies in the Rural Districts of Kent and Essex—it is manifest that they could not be of long duration.

Here it may be also well to state, that if in any public inquiry it should be attempted to ascribe the increased amount of sickness in the Town Districts to the less healthy nature of the districts, or their peculiar local influence on health, the conclusion would certainly be fallacious. Arguments precisely similar to those made use of in reference to the mortality of those districts, will explain the differences in the ratio of sickness in the same places; and it is therefore to be inferred, that whatever sanitary regulations may be carried out for promoting the health of towns, still the wide distinction between the rates of sickness and mortality in particular districts will not disappear. The cause of that difference is beyond the reach of any sanitary measure; and unless a change were to take place in the character and machinery of the manufactures of a town, by which the workmen would be habituated to less restrained, but more natural and complete physical exercises, no improvement in the state of health is to be looked for.

The evils, which relate to health, and are represented, by some writers, to exist to so frightful an extent, and to connect themselves with defective sewerage, filthy streets, and ill-planned houses, are certainly overstated by them. The data brought forward have generally been of the most indefinite and insufficient nature; and when, in connection with this, the erroneous methods employed, and the promiscuous manner in which their figures are generally combined, are kept in view, it must seem surprising that the thinking and intelligent portion of the community should have given their opinions any credence, or believed their conclusions entitled to so much weight.

Perhaps no statistical facts are better established than the duration of life among the middle and upper classes of this country; and if the data brought forward in this paper be received as of sufficient merit to represent the duration of life among the working classes, it will then appear clear that any important change to be hoped for in the value of life in the Town Districts, must be effected through other means than sanitary regulations.

Those persons who purchase Government Annuities, and have dealings with Assurance Companies, are certainly beyond the reach of any improvements to be introduced by local regulations; and if cleanliness of habit, comfort of dwellings, and fresh air, be of themselves powerful elements in raising the standard of life, their influence should be felt among that class of persons. But what are the actual results? The poor workmen inhabiting the miserable streets of our large towns, and inhaling their supposed noxious vapours, are actually longer lived than the affluent and upper classes, whose easy circumstances enable them to inhabit comparatively the palaces of the kingdom.

It is evident, from the great disparity in the value of life among different classes of workmen, whose conditions as to whatever is within the scope of public sanitary measures are the same, that other elements must exist having a powerful influence on the duration of life. It will further appear, that by viewing the various classes of society more in connection with the physical exercises to which they are habituated, than in connection with their moral position and rank in society, and consequently with their sanitary condition, a better clue will be found to the differences in the duration of life. It is not to be expected that any arrangements whatever as to the drainage and planning of streets are likely to add to the longevity of a Tailor; but if it were possible to give to his frame the physical exercises of a Ploughman, 20 per cent. would be added to the duration of his life. Neither is it to be thought that the Plumber, Painter, and Glazier is to be relieved from the poison of the metallic emanations to which he is exposed; nor that the Clerk can inhale the fresh air, and indulge in those exercises necessary to develope his physical constitution, while he follows the drudgeries of the counting-house. It is an aggregation of these, and other employments similarly conditioned, which make up the excessive mortality of our large towns; and since it has been shewn in the preceding pages, that this class of lives is also less healthy even in the Country Districts, and that the Town populations are chiefly made up of persons following such occupations, the legitimate result to be expected is a shorter duration of life in Towns, independent of any local influence on health. If improvements and changes are to be effected in the sanitary regulations of our large towns and cities, let them at once be carried out—not upon the necessity of such municipal innovations to avert a pestilential havoc in human life—but on the true merits of the question—the comforts, conveniences, and elevation of taste, and moral purity, thence arising.

RATES AND CONTRIBUTIONS OF FRIENDLY SOCIETIES.

The influence of the preceding results on the Rates and Contributions of Friendly Societies is perhaps that which generally most concerns the members of those institutions, and it is proposed to add a few remarks bearing on this subject.

The first point to which attention will be directed is the Table at page 470, being the Value of Annuities, according to the Rates of Mortality, developed in this inquiry, for Friendly Societies in the Rural, Town, and City Districts of England and Wales,—for the average of these districts combined,—and also for Friendly Societies in Scotland.

The rate of interest assumed in the following calculations is three per cent. per annum. In almost every other calculation extant for the purposes of friendly societies, a higher rate of interest has been adopted; but a careful investigation of the returns on this point, as given in the Schedules referred to at page 18 *ante*, has shewn that in practice a higher rate of interest is not realised by societies.

The Commissioners for the Reduction of the National Debt have hitherto allowed friendly societies £3 16*s.* 0½*d.* per cent.; but even in the cases where this mode of investment has been taken advantage of, the difficulty of collecting all the funds at the moment they fall due, and of immediately employing them in the Government Stock, together with the balance, large as compared with the whole amount of the Societies' funds, usually kept in hand to meet approaching liabilities, renders it difficult to make much beyond three per cent*. It is intended, on another occasion, to publish an account of the Money Transactions of those societies; this and some other points of interest will then be more fully entered on.

The distinguishing features of the rates of mortality in the respective districts, will of course develope themselves also in the same order or relation in the value of [annuities

* The 13th and 14th Victoria, c. 115, limits the rate of interest to 3 per cent. to such societies as invest their money with the Commissioners for the reduction of the National Debt.

TABLE A H.

Value of Immediate Annuities of £1—Three per Cent.—Friendly Societies—Males.

Age.	England and Wales.				Scotland.	Age.	England and Wales.				Scotland.
	Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.		Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town and City Districts.
10	24·61632	24·27400	23·43143	24·35763	24·10883	56	13·31464	11·50235	11·66400	12·72113	12·51643
11	24·41047	24·07109	23·23032	24·15702	23·89434	57	12·95600	11·15426	11·30160	12·37084	12·17706
12	24·20063	23·86153	23·02250	23·94400	23·67276	58	12·59386	10·81044	10·93138	12·01822	11·84246
13	23·98917	23·64750	22·80943	23·72818	23·44805	59	12·22800	10·46922	10·55836	11·66283	11·51303
14	23·78095	23·43160	22·59255	23·51365	23·22400	60	11·85797	10·12786	10·18722	11·27757	11·18877
15	23·58105	23·21610	22·37367	23·30430	23·00442	61	11·48326	9·78460	9·82249	10·94181	10·86980
16	23·39455	23·00345	22·15454	23·10414	22·79300	62	11·10358	9·43712	9·46849	10·57626	10·55610
17	23·22640	22·79635	21·93658	22·91737	22·59383	63	10·72266	9·08728	9·12371	10·20975	10·24548
18	23·07225	22·59175	21·72235	22·74025	22·40412	64	10·34375	8·73662	8·78649	9·84452	9·93576
19	22·92705	22·38755	21·50680	22·56903	22·22109	65	9·97031	8·38614	8·45537	9·48291	9·62477
20	22·78605	22·18086	21·29054	22·39981	22·04167	66	9·60504	8·03702	8·12865	9·12712	9·30987
21	22·64448	21·96915	21·07148	22·22877	21·86338	67	9·25086	7·67621	7·80451	8·77879	8·98874
22	22·49689	21·74986	20·84833	22·05200	21·68318	68	8·90874	7·33835	7·48318	8·44034	8·66475
23	22·34304	21·52440	20·62022	21·86972	21·49955	69	8·57973	7·01904	7·16481	8·11400	8·34066
24	22·18292	21·29318	20·38789	21·63188	21·31145	70	8·26474	6·72612	6·84949	7·80205	8·01955
25	22·01579	21·05800	20·15300	21·48840	21·11751	71	7·96482	6·46778	6·53675	7·50654	7·70359
26	21·84136	20·81944	19·96316	21·28940	20·91630	72	7·68100	6·25298	6·22603	7·22975	7·39504
27	21·65960	20·57913	19·73007	21·03658	20·70658	73	7·40930	6·06875	5·91766	6·96633	7·08770
28	21·47000	20·33647	19·49647	20·87542	20·48945	74	7·14587	5·90191	5·61182	6·71128	6·77363
29	21·27267	20·09112	19·26054	20·66028	20·26557	75	6·88702	5·73900	5·30768	6·45931	6·44582
30	21·06763	19·84248	19·02036	20·48675	20·05456	76	6·62847	5·56533	5·00499	6·20508	6·09695
31	20·85509	19·59018	18·77441	20·21330	19·80200	77	6·36606	5·36540	4·70212	5·94296	5·71922
32	20·63443	19·33360	18·52500	19·98129	19·56424	78	6·10648	5·14290	4·40298	5·67803	5·33261
33	20·40640	19·07210	18·27270	19·74337	19·32340	79	5·85586	4·90115	4·11130	5·41504	4·95516
34	20·17068	18·80480	18·01850	19·49931	19·07981	80	5·62034	4·64316	3·82960	5·15847	4·60254
35	19·92773	18·53330	17·76316	19·24911	18·83406	81	5·40678	4·37100	3·56015	4·91444	4·29019
36	19·67773	18·25237	17·50736	18·99251	18·58630	82	5·21980	4·08611	3·30160	4·69007	4·03404
37	19·42066	17·96322	17·24837	18·72926	18·33715	83	5·04401	3·79485	3·06014	4·46145	3·81818
38	19·15621	17·66640	16·98677	18·45953	18·08450	84	4·86291	3·50268	2·83225	4·23505	3·62747
39	18·88434	17·36206	16·72339	18·18351	17·82613	85	4·65920	3·21398	2·61777	3·99517	3·44665
40	18·60452	17·01150	16·45861	17·90117	17·56000	86	4·41348	2·93159	2·41629	3·73033	3·25875
41	18·31665	16·73244	16·19333	17·61300	17·28364	87	4·10858	2·65510	2·22636	3·42713	3·04495
42	18·02014	16·40755	15·92806	17·31871	16·99946	88	3·76105	2·39396	2·04977	3·10549	2·81520
43	17·71582	16·07676	15·66103	17·01872	16·70175	89	3·39248	2·15258	1·88657	2·78158	2·57870
44	17·40402	15·74122	15·35518	16·71312	16·39787	90	3·02089	1·93288	1·73900	2·46913	2·34280
45	17·08533	15·40168	15·11524	16 40208	16·09068	91	2·65479	1·74300	1·60812	2·17900	2·11326
46	16·76030	15·05846	14·83307	16·08555	15·78305	92	2·30650	1·59387	1·50023	1·92234	1·89662
47	16·42930	14·78087	14·54220	15·76346	15·47786	93	1·97634	1·47303	1·40692	1·69776	1·69062
48	16·09331	14·36475	14·24400	15·43682	15·17233	94	1·66030	1·36348	1·31985	1·49154	1·49376
49	15·75360	14·01364	13·93953	15·10626	14·86383	95	1·36282	1·24523	1·23064	1·29460	1·29804
50	15·41074	13·65935	13·63015	14·77241	14·54962	96	1·08952	1·10854	1·11756	1·09510	1·09461
51	15·06580	13·30187	13·31674	14·43585	14·22726	97	·84272	·92994	·91859	·86836	·86526
52	14·71963	12·94057	13·00044	14·09700	13·89373	98	·54623	·69119	·66372	·63000	·62692
53	14·37185	12·57787	12·67900	13·75630	13·55275	99	·32906	·46978	·41609	·37489	·37448
54	14·02204	12·21570	12·35046	13·41343	13·20754	100	...	...	...	...	...
55	13·66985	11·85678	12·01300	13·06832	12·86124						

TABLE A I.

Value of Deferred Annuities of £1 to commence at Age 70—Three per Cent.—Friendly Societies—Males.

Age.	England and Wales.				Scotland.	Age.	England and Wales.				Scotland.
	Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.		Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.
10	·65112	·42290	·38922	·56105	·5388	40	1·91180	1·23160	1·20038	1·65581	1·6149
11	·67220	·43679	·40249	·57933	·5563	41	1·98498	1·28084	1·25396	1·72164	1·6814
12	·69396	·45113	·41622	·59820	·5744	42	2·06122	1·33252	1·31085	1·79063	1·7507
13	·71657	·46599	·43044	·61780	·5933	43	2·14079	1·38687	1·37118	1·86301	1·8230
14	·74022	·48144	·44522	·63825	·6129	44	2·22395	1·44419	1·43505	1·93902	1·8989
15	·76513	·49756	·46062	·65971	·6335	45	2·31101	1·50478	1·50262	2·01895	1·9792
16	·79152	·51444	·47669	·68235	·6552	46	2·40231	1·56895	1·57398	2·10308	2·0643
17	·81967	·53217	·49352	·70637	·6782	47	2·49820	1·63714	1·64923	2·19172	2·1552
18	·84952	·55074	·51120	·73173	·7025	48	2·59917	1·70967	1·72882	2·28534	2·2519
19	·88099	·57013	·52966	·75840	·7282	49	2·70581	1·78690	1·81324	2·38445	2·3546
20	·91400	·59034	·54896	·78632	·7551	50	2·81868	1·86923	1·90308	2·48959	2·4632
21	·94843	·61132	·56910	·81541	·7832	51	2·93849	1·95716	1·99894	2·60140	2·5779
22	·98414	·63304	·59008	·84561	·8126	52	3·06602	2·05114	2·10157	2·72055	2·6987
23	1·02115	·65558	·61192	·87697	·8432	53	3·20187	2·15215	2·21126	2·84777	2·8267
24	1·05954	·67900	·63470	·90953	·8750	54	3·34673	2·26133	2·32836	2·98381	2·9632
25	1·09932	·70339	·65852	·94337	·9081	55	3·50134	2·37996	2·45326	3·12949	3·1099
26	1·14054	·72882	·68500	·97854	·9425	56	3·66650	2·50954	2·59217	3·28575	3·2684
27	1·18327	·75542	·71131	1·01511	·9781	57	3·84311	2·65177	2·72759	3·45365	3·4408
28	1·22754	·78322	·73894	1·05316	1·0151	58	4·03232	2·80777	2·87958	3·63438	3·6289
29	1·27343	·81228	·76790	1·09275	1·0536	59	4·23536	2·97887	3·04474	3·82931	3·8344
30	1·32102	·84266	·79819	1·13398	1·0936	60	4·45356	3·16628	3·22609	4 04001	4·0594
31	1·37039	·87441	·82984	1·17690	1·1354	61	4·68840	3·37159	3·42727	4·26812	4·3065
32	1·42161	·90759	·86301	1·22161	1·1791	62	4·94166	3·59644	3·65267	4·51560	4·5784
33	1·47479	·94226	·89785	1·26821	1·2249	63	5·21719	3·84421	3·90544	4·78608	4·8774
34	1·53003	·97846	·93449	1·31676	1·2728	64	5·51939	4·11891	4·18914	5·08364	5·2060
35	1·58746	1·01625	·97311	1·36739	1·3232	65	5·85372	4·42512	4·50804	5·41330	5·5670
36	1·64720	1·05568	1·01388	1·42021	1·3760	66	6·22638	4·76857	4·86701	5·78105	5·9633
37	1·70939	1·09679	1·05679	1·47529	1·4316	67	6·64502	5·14782	5·27168	6·19381	6·3981
38	1·77413	1·13973	1·10204	1·53282	1·4899	68	7·11758	5·59187	5·73009	6·66056	6·8793
39	1·84517	1·18461	1·14982	1·59294	1·5510	69	7·65366	6·11056	6·25203	7·19217	7·4159

TABLE A K.

Value of Temporary Annuities of £1 to continue till Age 70.—Three per Cent.—Friendly Societies.—Males.

Age.	England and Wales.				Scotland.	Age.	England and Wales.				Scotland.
	Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.		Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.
10	23·96250	23·85110	23·04221	23·79658	23·5700	40	16·69272	15·77990	15·25823	16·24536	15·9451
11	23·73827	23·63430	22·82783	23·57769	23·3380	41	16·33167	15·45160	14·93937	15·89136	15·6022
12	23·50667	23·41040	22·60628	23·34580	23·0984	42	15·95892	15·07503	14·61721	15·52808	15·2488
13	23·27260	23·18151	22·37899	23·11038	22·8548	43	15·57503	14·68989	14·28985	15·15571	14·8788
14	23·04073	22·95016	22·14733	22·87540	22·6111	44	15·18007	14·29703	13·92013	14·77410	14·4990
15	22·81592	22·71854	21·91305	22·64459	22·3709	45	14·77431	13·89690	13·61262	14·38313	14·1115
16	22·60303	22·48901	21·67785	22·42179	22·1378	46	14·35799	13·48951	13·25909	13·98247	13·7188
17	22·40673	22·26418	21·44306	22·21100	21·9156	47	13·93110	13·14373	12·89297	13·57174	13·3227
18	22·22273	22·04101	21·21115	22·00852	21·7016	48	13·49414	12·65508	12·51518	13·14148	12·9204
19	22·04606	21·81742	20·97714	21·81063	21·4929	49	13·04779	12·22674	12·12629	12·72181	12·5092
20	21·87205	21·59052	20·74158	21·61349	21·2866	50	12·59206	11·79012	11·72707	12·28282	12·0864
21	21·69605	21·35783	20·50238	21·41336	21·0802	51	12·12731	11·34471	11·31780	11·83445	11·6494
22	21·51275	21·11682	20·25825	21·20639	20·8706	52	11·64361	10·88943	10·89887	11·37645	11·1950
23	21·32189	20·86882	20·00830	20·99275	20·6564	53	11·16998	10·42572	10·46774	10·90853	10·7261
24	21·12338	20·61418	19·75319	20·72235	20·4365	54	10·67531	9·95437	10·02210	10·42962	10·2443
25	20·91647	20·35461	19·49448	20·54503	20·2094	55	10·16851	9·47682	9·55974	9·93883	9·7513
26	20·70082	20·09062	19·27816	20·31086	19·9738	56	9·64814	8·99281	9·07183	9·43538	9·2480
27	20·47633	19·82371	19·01876	20·02147	19·7285	57	9·11289	8·50249	8·57401	8·91719	8·7363
28	20·24246	19·55325	18·75753	19·82226	19·4744	58	8·56154	8·00267	8·05180	8·38384	8·2136
29	19·99924	19·27884	18·49264	19·56753	19·2120	59	7·99264	7·49035	7·51362	7·83352	7·6786
30	19·74661	18·99982	18·23217	19·35277	18·9610	60	7·40441	6·96158	6·96113	7·23756	7·1294
31	19·48470	18·71577	17·94457	19·03640	18·6666	61	6·79486	6·41301	6·39522	6·67369	6·5633
32	19·21282	18·42601	17·66199	18·75968	18·3851	62	6·16192	5·84068	5·81582	6·06066	5·9777
33	18·93161	18·12984	17·37485	18·47516	18·0985	63	5·50547	5·24307	5·21827	5·42367	5·3681
34	18·64065	17·82634	17·08401	18·18255	17·8070	64	4·82436	4·61771	4·59735	4·76088	4·7298
35	18·34027	17·51705	16·79005	17·88172	17·5109	65	4·01659	3·96102	3·94733	4·06961	4·0578
36	18·03053	17·19669	16·49348	17·57230	17·2103	66	3·37866	3·26845	3·26164	3·34607	3·3466
37	17·71127	16·86643	16·19158	17·25397	16·9056	67	2·60584	2·52839	2·53283	2·58498	2·5906
38	17·38208	16·52667	15·88473	16·92671	16·5946	68	1·79116	1·74648	1·75309	1·77978	1·7855
39	17·04277	16·17745	15·57357	16·59057	16·2751	69	·92607	·90848	·91278	·92183	·9248

TABLE A L.

Single Premium for £1 at Death—Three per Cent.—Friendly Societies—Males.

Age.	England and Wales.				Scotland.	Age.	England and Wales.				Scotland.
	Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.		Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.
10	·25397	·26387	·28840	·26143	·26868	56	·58307	·63585	·63115	·60035	·60632
11	·25989	·26977	·29426	·26727	·27492	57	·59351	·64599	·64170	·61056	·61620
12	·26600	·27588	·30031	·27348	·28137	58	·60406	·65601	·65248	·62083	·62595
13	·27216	·28211	·30652	·27976	·28791	59	·61472	·66595	·66335	·63118	·63554
14	·27822	·28840	·31284	·28601	·29445	60	·62550	·67589	·67416	·64240	·64499
15	·28404	·29468	·31921	·29211	·30084	61	·63641	·68589	·68478	·65218	·65428
16	·28948	·30087	·32560	·29794	·30700	62	·64747	·69601	·69509	·66283	·66341
17	·29438	·30690	·33194	·30338	·31280	63	·65856	·70620	·70514	·67350	·67246
18	·29886	·31286	·33818	·30853	·31833	64	·66960	·70980	·71496	·68414	·68148
19	·30309	·31881	·34446	·31352	·32366	65	·68048	·72662	·72460	·69467	·69054
20	·30720	·32483	·35076	·31845	·32888	66	·69112	·73679	·73412	·70504	·69971
21	·31133	·33099	·35714	·32343	·33408	67	·70143	·74730	·74356	·71518	·70907
22	·31562	·33738	·36364	·32858	·33932	68	·71140	·75713	·75292	·72504	·71850
23	·32011	·34395	·37029	·33389	·34467	69	·72098	·76344	·76219	·73454	·72794
24	·32477	·35068	·37705	·34082	·35015	70	·73015	·77497	·77137	·74363	·73729
25	·32964	·35753	·38389	·34500	·35580	71	·73889	·73249	·78048	·75224	·74650
26	·33472	·36448	·38942	·35079	·36166	72	·74716	·78874	·78953	·76030	·75549
27	·34001	·37148	·39621	·35816	·36777	73	·75507	·79411	·79851	·76797	·76443
28	·34553	·37855	·40301	·36285	·37409	74	·76274	·79897	·80742	·77540	·77358
29	·35128	·38570	·40989	·36912	·38061	75	·77028	·80372	·81628	·78274	·78313
30	·35725	·39294	·41688	·37417	·38676	76	·77781	·80878	·82510	·79014	·79329
31	·36344	·40029	·42405	·38214	·39412	77	·78545	·81460	·83392	·79778	·80430
32	·36987	·40776	·43131	·38889	·40104	78	·79302	·82108	·84263	·80549	·81556
33	·37651	·41538	·43866	·39582	·40806	79	·80031	·82812	·85113	·81316	·82655
34	·38480	·42316	·44606	·40293	·41515	80	·80718	·83564	·85933	·82063	·83682
35	·39046	·43107	·45350	·41022	·42231	81	·81339	·84356	·86718	·82774	·84592
36	·39774	·43925	·46095	·41769	·42953	82	·81884	·85186	·87471	·83427	·85338
37	·40522	·44767	·46850	·42536	·43678	83	·82400	·86034	·88174	·84093	·85966
38	·41292	·45632	·47611	·43322	·44414	84	·82924	·86885	·88838	·84752	·86522
39	·42085	·46518	·48378	·44125	·45167	85	·83517	·87726	·89463	·85451	·87048
40	·42900	·47539	·49150	·44948	·45942	86	·84233	·88549	·90050	·86222	·87596
41	·43738	·48352	·49922	·45787	·46747	87	·85121	·89354	·90603	·87106	·88218
42	·44602	·49298	·50695	·46645	·47574	88	·86133	·90115	·91117	·88042	·88888
43	·45488	·50262	·51473	·47518	·48441	89	·87206	·90818	·91592	·88986	·89577
44	·46396	·51239	·52634	·48418	·49326	90	·88289	·91457	·92022	·89896	·90264
45	·47324	·52228	·53064	·49314	·50221	91	·89355	·92011	92404	·90741	·90932
46	·48271	·53228	·53884	·50236	·51117	92	·90369	·92445	·92718	·91488	·91563
47	·49235	·54036	·54731	·51174	·52006	93	·91331	·92797	·92990	·92142	·92163
48	·50214	·55248	·55600	·52125	·52896	94	·92251	·93116	·93243	·92743	·92736
49	·51203	·56271	·56487	·53088	·53795	95	·93118	·93461	·93503	·93317	·93307
50	·52202	·57303	·57388	·54061	·54710	96	·93914	93859	·93832	·93898	·93899
51	·53206	·58344	·58301	·55041	·55649	97	·94633	·94379	·94412	·94558	·94567
52	·54215	·59396	·59222	·56028	·56620	98	·95497	·95074	·95154	·95252	·95261
53	·55227	·60453	·60158	·57020	·57613	99	·96129	·95719	·95875	·95995	·95997
54	·56247	·61508	·61115	·58019	·58619	100	...	...	...	...	...
55	·57272	·62553	·62098	·59024	·59628						

TABLE A M.

Annual Premium for £1 at Death—Three per Cent.—Friendly Societies.—Males.

Age.	England and Wales.				Scotland.	Age.	England and Wales.				Scotland.
	Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.		Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.
10	·00992	·01044	·01181	·01031	·01070	56	·04073	·05086	·04984	·04375	·04486
11	·01023	·01076	·01215	·01062	·01104	57	·04253	·05315	·05216	·04566	·04676
12	·01056	·01110	·01250	·01096	·01140	58	·04444	·05555	·05469	·04769	·04874
13	·01089	·01145	·01287	·01131	·01178	59	·04647	·05806	·05739	·04985	·05079
14	·01123	·01181	·01326	·01167	·01216	60	·04865	·06074	·06026	·05232	·05292
15	·01156	·01217	·01366	·01202	·01253	61	·05098	·06360	·06327	·05461	·05512
16	·01187	·01254	·01406	·01236	·01290	62	·05349	·06669	·06640	·05726	·05741
17	·01215	·01290	·01447	·01269	·01326	63	·05618	·07001	·06965	·06008	·05980
18	·01242	·01326	·01488	·01300	·01360	64	·05903	·07124	·07306	·06309	·06232
19	·01267	·01363	·01531	·01330	·01394	65	·06203	·07742	·07663	·06627	·06499
20	·01292	·01401	·01574	·01361	·01427	66	·06517	·08153	·08042	·06962	·06787
21	·01317	·01441	·01618	·01392	·01461	67	·06843	·08613	·08445	·07314	·07099
22	·01343	·01483	·01664	·01425	·01496	68	·07180	·09080	·08875	·07680	·07434
23	·01371	·01527	·01713	·01460	·01532	69	·07526	·09558	·09335	·08060	·07793
24	·01401	·01573	·01763	·01506	·01569	70	·07881	·10031	·09827	·08448	·08174
25	·01432	·01621	·01815	·01534	·01609	71	·08242	·10478	·10356	·08843	·08577
26	·01465	·01671	·01858	·01574	·01650	72	·08607	·10875	·10926	·09238	·08999
27	·01501	·01722	·01911	·01625	·01694	73	·08979	·11234	·11543	·09640	·09452
28	·01538	·01774	·01966	·01659	·01741	74	·09364	·11576	·12212	·10055	·09951
29	·01577	·01829	·02023	·01704	·01790	75	·09767	·11926	·12941	·10493	·10518
30	·01619	·01885	·02082	·01741	·01837	76	·10196	·12319	·13740	·10966	·11178
31	·01663	·01944	·02145	·01801	·01895	77	·10663	·12798	·14625	·11490	·11970
32	·01710	·02005	·02209	·01854	·01950	78	·11159	·13367	·15596	·12062	·12879
33	·01759	·02070	·02276	·01908	·02008	79	·11673	·14033	·16652	·12676	·13880
34	·01818	·02137	·02345	·01966	·02068	80	·12193	·14808	·17793	·13325	·14937
35	·01866	·02207	·02417	·02026	·02129	81	·12696	·15706	·19016	·13955	·15990
36	·01924	·02282	·02491	·02089	·02193	82	·13165	·16749	·20335	·14662	·16952
37	·01984	·02361	·02567	·02156	·02259	83	·13636	·17943	·21717	·15397	·17842
38	·02049	·02445	·02647	·02226	·02327	84	·14144	·19297	·23181	·16189	·18697
39	·02117	·02533	·02730	·02300	·02399	85	·14758	·20818	·24729	·17107	·19576
40	·02188	·02639	·02815	·02378	·02475	86	·15560	·22522	·26359	·18228	·20568
41	·02264	·02727	·02904	·02460	·02557	87	·16662	·24446	·28082	·19676	·21809
42	·02345	·02832	·02995	·02546	·02643	88	·18091	·26551	·29876	·21445	·23298
43	·02431	·02943	·03089	·02637	·02737	89	·19853	·28807	·31730	·23531	·25031
44	·02521	·03061	·03202	·02734	·02835	90	·21958	·31183	·33597	·25913	·27003
45	·02617	·03184	·03293	·02834	·02939	91	·24449	·33544	·35430	·28544	·29208
46	·02718	·03315	·03403	·02940	·03046	92	·27331	·35633	·37084	·31307	·31611
47	·02825	·03424	·03522	·03053	·03156	93	·30686	·37524	·38635	·34154	·34254
48	·02938	·03596	·03647	·03171	·03271	94	·34677	·39397	·40193	·37224	·37187
49	·03056	·03748	·03781	·03296	·03391	95	·39410	·41627	·41918	·40668	·40604
50	·03181	·03909	·03923	·03428	·03518	96	·44946	·44515	·44311	·44818	·44827
51	·03312	·04080	·04072	·03566	·03655	97	·51356	·48904	·49209	·50609	·50698
52	·03449	·04261	·04230	·03711	·03802	98	·61762	·56217	·57194	·58437	·58554
53	·03593	·04452	·04398	·03864	·03959	99	·72326	·65124	·67704	·69820	·69841
54	·03744	·04654	·04578	·04025	·04126	100	...	...	...	...	...
55	·03904	·04865	·04772	·04196	·04302						

TABLE A N.

Temporary Annual Premium to continue till Age 70 for £1 at Death—Three per Cent.—Friendly Societies—Males.

Age.	England and Wales.				Scotland.	Age.	England and Wales.				Scotland.
	Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.		Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.
10	·01017	·01062	·01200	·01054	·01094	40	·02425	·02833	·03023	·02606	·02711
11	·01051	·01095	·01235	·01088	·01130	41	·02524	·02939	·03132	·02711	·02816
12	·01086	·01130	·01272	·01123	·01168	42	·02630	·03067	·03246	·02822	·02928
13	·01121	·01167	·01311	·01160	·01207	43	·02744	·03203	·03367	·02941	·03051
14	·01157	·01204	·01352	·01198	·01247	44	·02868	·03350	·03510	·03070	·03183
15	·01193	·01242	·01393	·01236	·01287	45	·03000	·03514	·03631	·03206	·03323
16	·01227	·01281	·01436	·01272	·01327	46	·03143	·03674	·03779	·03353	·03473
17	·01258	·01319	·01479	·01307	·01365	47	·03298	·03821	·03939	·03512	·03631
18	·01287	·01358	·01523	·01341	·01402	48	·03465	·04046	·04114	·03686	·03800
19	·01315	·01397	·01567	·01375	·01439	49	·03645	·04254	·04303	·03869	·03982
20	·01343	·01438	·01613	·01408	·01476	50	·03841	·04480	·04509	·04070	·04181
21	·01372	·01480	·01661	·01443	·01513	51	·04062	·04726	·04733	·04289	·04399
22	·01402	·01526	·01711	·01480	·01552	52	·04288	·04995	·04977	·04527	·04643
23	·01434	·01573	·01763	·01522	·01592	53	·04538	·05291	·05246	·04788	·04913
24	·01468	·01623	·01817	·01569	·01633	54	·04818	·05615	·05545	·05076	·05213
25	·01504	·01674	·01873	·01601	·01678	55	·05128	·05971	·05881	·05396	·05546
26	·01543	·01728	·01920	·01646	·01724	56	·05476	·06363	·06267	·05753	·05917
27	·01583	·01784	·01979	·01704	·01774	57	·05869	·06798	·06702	·06157	·06329
28	·01627	·01842	·02040	·01743	·01827	58	·06318	·07287	·07208	·06616	·06794
29	·01673	·01902	·02103	·01795	·01883	59	·06836	·07844	·07792	·07145	·07323
30	·01722	·01965	·02168	·01838	.01938	60	·07443	·08489	·08468	·07798	·07934
31	·01774	·02030	·02238	·01907	·02004	61	·08164	·09253	·09260	·08499	·08651
32	·01830	·02099	·02311	·01968	·02069	62	·09041	·10175	·10198	·09388	·09507
33	·01889	·02171	·02387	·02033	·02137	63	·10123	·11312	·11340	·10485	·10560
34	·01959	·02248	·02467	·02101	·02207	64	·11496	·12635	·12773	·11876	·11894
35	·02019	·02328	·02549	·02173	·02281	65	·13565	·14647	·14646	·13703	·13653
36	·02090	·02414	·02635	·02249	·02359	66	·15784	·17261	·17226	·16223	·16098
37	·02166	·02506	·02725	·02330	·02439	67	·19453	·21180	·21047	·19949	·19748
38	·02246	·02604	·02820	·02417	·02524	68	·25488	·27567	·27348	·26083	·25794
39	·02333	·02708	·02919	·02509	·02615	69	·37433	·40160	·39847	·38221	·37819

TABLE A O.

Probability of Living One Year.—Friendly Societies—Males.

Age.	England and Wales.				Scotland.	Age.	England and Wales.				Scotland.
	Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.		Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.
10	·997700	·997250	·996040	·997500	·99750	56	·982666	·974756	·976612	·979928	·97838
11	·997705	·997253	·996034	·997504	·99750	57	·981669	·972773	·975633	·978780	·97663
12	·997498	·997154	·995958	·997337	·99734	58	·980622	·970838	·974129	·977568	·97480
13	·997090	·996945	·995810	·996997	·99701	59	·979537	·969035	·972100	·976283	·97290
14	·996475	·996632	·995579	·996493	·99651	60	·978407	·967278	·969541	·974951	·97091
15	·995652	·996214	·995263	·995821	·99586	61	·977212	·965606	·966439	·973550	·96883
16	·994635	·995680	·994882	·994978	·99504	62	·975604	·963612	963337	·971793	·96686
17	·993807	·995273	·994381	·994298	·99434	63	·973606	·961309	·960244	·969710	·96499
18	·993203	·994952	·994101	·993781	·99376	64	·971172	·958725	·957137	·967276	·96321
19	·992803	·994751	·993784	·993432	·99332	65	·968353	·955815	·954033	·964479	·96156
20	·992605	·994651	·993556	·993243	·99298	66	·965108	·954118	950934	·961360	·96000
21	·992634	·994653	·993377	·993217	·99277	67	·961614	·948208	·947598	·957820	·95796
22	·992664	·994583	·993227	·993171	·99263	68	·957857	·942570	·944012	·953868	·95547
23	·992685	·994479	·993030	·993123	·99252	69	·953845	·935736	·940157	·949486	·95248
24	·992728	·994289	·992745	·993055	·99246	70	·949565	·927706	·936080	·944698	·94905
25	·992772	·994054	·990194	·992985	·99246	71	·945026	·918493	·933895	·939486	·94516
26	·992807	·993749	·991895	·992892	·99250	72	·940795	·911133	·927020	·934765	·94179
27	·992853	·993440	·991486	·992787	·99248	73	·936865	·905664	·921866	·930496	·93911
28	·992880	·993146	·991157	·992679	·99241	74	·933210	·902058	·916366	·926711	·93701
29	·992895	·992869	·990909	·992558	·99227	75	·929889	·900362	·910395	·923389	·93550
30	·992890	·992597	·990723	·992435	·99208	76	·926863	·900540	·904073	·920535	·93461
31	·992895	·992342	·990408	·992298	·99182	77	·922684	·899633	·896392	·916625	·93023
32	·992856	·992104	·990037	·992160	·99153	78	·917416	·897655	·887262	·911667	·92232
33	·992816	·991894	·989609	·992017	·99120	79	·911062	·894566	·876812	·905725	·91098
34	·992741	·991703	·989122	·991860	·99083	80	·903566	·890423	·864990	·898349	·89612
35	·992641	·991530	·988585	·991700	·99044	81	·895364	·885180	·852462	·890443	·87780
36	·992528	·991388	·988175	·991537	·99001	82	·889540	·877754	·837570	·883503	·86237
37	·992412	·991196	·987715	·991347	·98967	83	·886136	·868081	·822477	·877794	·84986
38	·992283	·990977	·987192	·991128	·98942	84	·885071	·856140	·806360	·873264	·84025
39	·992163	·990705	·986624	·990892	·98927	85	·886486	·842001	·789248	·870008	·83359
40	·992028	·990401	·985986	·990613	·98923	86	·889855	·826116	·771388	·867801	·82980
41	·991903	·990054	·985297	·990316	·98928	87	·888845	·805770	·751910	·859812	·82206
42	·991714	·989636	·984685	·989986	·98914	88	·881935	·782148	·731410	·845851	·81026
43	·991484	·989120	·984155	·989621	·98879	89	·869024	·755964	·709444	·825862	·79456
44	·991202	·988525	·983683	·989222	·98825	90	·851890	·725800	·686766	·800000	·77510
45	·990855	·987873	·983303	·988797	·98751	91	·826988	·692127	·662486	·768006	·75145
46	·990466	·987097	·983006	·988347	·98657	92	·798192	·663837	·641996	·733945	·72605
47	·989988	·986306	·982584	·987804	·98577	93	·765190	·641944	·624665	·701852	·69828
48	·989406	·985484	·982044	·987190	·98510	94	·723755	·625498	·609442	·669525	·66952
49	·988755	·984631	·981378	·986500	·98457	95	·671780	·608280	·598592	·636453	·63830
50	·988003	·983727	·980604	·985730	·98416	96	·568349	·591623	·600000	·603715	·60444
51	·987160	·982810	·979701	·984890	·98391	97	·605112	·566372	·568628	·548718	·54779
52	·986298	·981654	·978906	·983985	·98336	98	·423077	·484375	·482759	·471963	·46980
53	·985418	·980270	·978196	·983043	·98253	99	·339713	·477232	·426602	·386139	·38571
54	·984516	·978663	·977564	·982053	·98143	100	...	...	...	...	...
55	·983605	·976814	·977049	·981017	·98005						

Probability of Dying in One Year.—Friendly Societies.—Males.

Age.	England and Wales.				Scotland.	Age.	England and Wales.				Scotland.
	Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.		Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.
10	·002300	·002750	·003960	·002500	·00250	56	·017334	·025244	·023388	·020072	·02162
11	·002295	·002747	·003966	·002496	·00250	57	·018331	·027227	·024367	·021220	·02337
12	·002502	·002846	·004042	·002663	·00266	58	·019378	·029162	·025871	·022432	·02520
13	·002910	·003055	·004190	·003003	·00299	59	·020463	·030965	·027900	·023717	·02710
14	·003525	·003368	·004421	·003507	·00349	60	·021593	·032722	·030459	·025049	·02909
15	·004348	·003786	·004737	·004179	·00414	61	·022788	·034394	·033561	·026450	·03117
16	·005365	·004320	·005118	·005022	·00496	62	·024396	·036388	·036663	·028207	·03314
17	·006193	·004727	·005619	·005712	·00566	63	·026394	·038691	·039756	·030290	·03501
18	·006797	·005048	·005899	·006219	·00624	64	·028828	·041275	·042863	·032724	·03679
19	·007197	·005249	·006216	·006568	·00668	65	·031647	·044185	·045967	·035521	·03844
20	·007395	·005349	·006444	·006757	·00702	66	·034892	·045882	·049066	·038640	·04000
21	·007366	·005347	·006623	·006783	·00723	67	·038386	·051792	·052402	·042180	·04204
22	·007336	·005417	·006773	·006829	·00737	68	·042143	·057430	·055988	·046132	·04453
23	·007315	·005521	·006970	·006877	·00748	69	·046155	·064264	·059843	·050514	·04752
24	·007272	·005711	·007255	·006945	·00754	70	·050435	·072294	·063920	·055302	·05095
25	·007228	·005946	·009806	·007015	·00754	71	·054974	·081507	·066105	·060514	·05484
26	·007193	·006251	·008105	·007108	·00750	72	·059205	·088867	·072980	·065235	·05821
27	·007147	·006560	·008514	·007213	·00752	73	·063135	·094336	·078134	·069504	·06089
28	·007120	·006854	·008843	·007321	·00759	74	·066790	·097942	·083634	·073289	·06299
29	·007105	·007131	·009091	·007442	·00773	75	·070111	·099638	·089605	·076611	·06450
30	·007110	·007403	·009277	·007565	·00792	76	·073137	·099460	·095927	·079465	·06539
31	·007105	·007658	·009592	·007702	·00818	77	·077316	·100367	·103608	·083375	·06977
32	·007144	·007896	·009963	·007840	·00847	78	·082584	·102345	·112738	·088333	·07768
33	·007184	·008106	·010391	·007983	·00880	79	·088938	·105434	·123188	·094275	·08902
34	·007259	·008297	·010878	·008140	·00917	80	·096434	·109577	·135010	·101651	·10388
35	·007359	·008470	·011415	·008300	·00956	81	·104636	·114820	·147538	·109557	·12220
36	·007472	·008612	·011825	·008463	·00999	82	·110460	·122246	·162430	·119497	·13763
37	·007588	·008804	·012285	·008653	·01033	83	·113864	·131919	·177523	·122206	·15014
38	·007717	·009023	·012808	·008872	·01058	84	·114929	·143860	·193640	·126736	·15975
39	·007837	·009295	·013376	·009108	·01073	85	·113514	·157999	·210752	·129992	·16641
40	·007972	·009599	·014014	·009387	·01077	86	·110145	·173884	·228612	·132199	·17020
41	·008097	·009946	·014703	·009684	·01072	87	·111155	·194230	·248090	·140188	·17794
42	·008286	·010364	·015315	·010014	·01086	88	·118065	·217852	·268590	·154149	·18974
43	·008516	·010880	·015845	·010379	·01121	89	·130976	·244036	·290556	·174138	·20544
44	·008798	·011475	·016317	·010778	·01175	90	·148110	·274200	·313234	·200000	·22490
45	·009145	·012127	·016697	·011203	·01249	91	·173012	·307873	·337514	·231994	·24855
46	·009534	·012903	·016994	·011653	·01343	92	·201808	·336173	·358004	·266055	·27395
47	·010012	·013694	·017416	·012196	·01423	93	·234810	·358056	·375335	·298148	·30172
48	·010594	·014516	·017956	·012810	·01490	94	·276245	·374502	·390558	·330475	·33048
49	·011245	·015369	·018622	·013500	·01543	95	·328220	·391720	·401408	·363547	·36170
50	·011997	·016273	·019396	·014270	·01584	96	·431651	·408377	·400000	·396285	·39556
51	·012840	·017190	·020299	·015110	·01609	97	·394888	·433628	·431372	·451282	·45221
52	·013702	·018346	·021094	·016015	·01664	98	·576923	·515625	·517241	·528037	·53020
53	·014582	·019730	·021804	·016957	·01747	99	·660287	·522768	·573398	·613861	·61429
54	·015484	·021337	·022436	·017947	·01857	100	...	...	...	...	...
55	·016395	·023186	·022951	·018983	·01995						

Table A Q.

Single Premium for Sickness Allowance of £1 *per Week to cease at Age* 70.—*Three per Cent.*—*Friendly Societies.*—*Males.*

Age.	England and Wales.				Scotland.	Age.	England and Wales.				Scotland.
	Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.		Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts
10	30·51966	36·22972	28·20766	31·86825	27·2409	40	46·56296	55·56052	46·00568	48·83092	44·1712
11	31·27814	36·13063	28·81759	32·43255	27·9050	41	47·25304	56·48385	46·55024	49·56284	44·9897
12	31·86005	36·21606	29·44849	32·91776	28·5906	42	47·94233	57·37929	47·09078	50·28311	45·8073
13	32·29090	36·45319	30·10321	33·34342	29·2782	43	48·62687	58·23508	47·61848	50·98924	46·6212
14	32·62343	36·80865	30·78488	33·73004	29·9474	44	49·30957	59·04067	48·12575	51·67874	47·4299
15	32·90212	37·24804	31·49726	34·09838	30·5778	45	49·99718	59·78395	48·60345	52·34908	48·2316
16	33·17729	37·73589	32·24450	34·47050	31·1483	46	50·69131	60·45116	49·04110	52·99728	49·0253
17	33·49848	38·23622	33·03046	34·86947	31·6374	47	51·39297	61·03194	49·42792	53·62002	49·8103
18	33·86100	38·74763	33·83867	35·29314	32·0632	48	52·09479	61·53154	49·75235	54·21257	50·5632
19	34·25860	39·27016	34·64059	35·73895	32·4440	49	52·78710	61·95589	50·00207	54·76878	51·2595
20	34·68519	39·80233	35·41518	36·20120	32·7979	50	53·45831	62·31153	50·16440	55·28222	51·8728
21	35·13445	40·34312	36·13620	36·68604	33·1448	51	54·09793	62·60595	50·22514	55·74687	52·3762
22	35·59858	40·89142	36·77765	37·18099	33·5043	52	54·69490	62·84480	50·17009	56·15597	52·7393
23	36·07612	41·45520	37·35127	37·68967	33·8776	53	55·23193	63·02802	49·97483	56·49660	52·9757
24	36·56585	42·04129	37·87207	38·21185	34·2665	54	55·60116	63·15490	49·61452	56·75405	53·0986
25	37·06553	42·65912	38·35728	38·74841	34·6727	55	55·95894	63·22429	49·06310	56·91284	53·1216
26	37·57332	43·31879	38·91030	39·29923	35·0976	56	56·19870	63·23545	48·29088	56·95763	53·0585
27	38·08797	44·02626	39·38292	39·86506	35·5429	57	56·29924	63·18569	47·26842	56·86948	52·9246
28	38·61335	44·77782	39·85820	40·44812	36·0118	58	56·20182	62·99597	45·99730	56·59299	52·6675
29	39·15479	45·56794	40·33660	41·04996	36·5070	59	55·84340	62·58375	44·47561	56·06855	52·2309
30	39·71760	46·39042	40·81807	41·67304	37·0322	60	55·15634	61·85428	42·69764	55·23260	51·5541
31	40·30747	47·23943	41·30351	42·31917	37·6777	61	54·06849	60·71069	40·65305	54·01532	50·5716
32	41·02354	48·10816	41·80177	42·99093	38·2774	62	52·50331	59·04517	38·32589	52·34221	49·2112
33	41·67624	48·99586	42·31243	43·68453	38·9130	63	50·30187	56·66607	35·67345	50·05733	47·2933
34	42·35024	49·90100	42·83533	44·39604	39·5825	64	47·28872	53·36069	32·64623	46·98774	44·6236
35	43·04039	50·82250	43·37036	45·12188	40·2840	65	43·27124	48·88897	29·18848	42·94219	40·9909
36	43·74110	51·75921	43·81632	45·85798	41·0152	66	38·02084	42·98096	25·23498	37·70515	36·1634
37	44·44605	52·70909	44·36256	46·60005	41·7747	67	31·30418	35·26872	20·71028	31·02805	29·8892
38	45·15279	53·66490	44·91049	47·34727	42·5575	68	22·90367	25·72042	15·26735	22·69965	21·9507
39	45·85947	54·61790	45·45883	48·09141	43·3583	69	12·56936	14·07064	8·51399	12·46247	12·0902

Table A R.

Temporary Annual Premium for Sickness Allowance of £1 per Week, to continue till Age 70.—Three per Cent.—Friendly Societies.—Males.

Age.	England and Wales.				Scotland.	Age.	England and Wales.				Scotland.
	Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.		Rural Districts.	Town Districts.	City Districts.	Rural, Town, and City Districts.	Rural, Town, and City Districts.
10	1·22262	1·45787	1·17326	1·28519	1·1087	40	2·63176	3·31129	2·82968	2·83154	2·6067
11	1·26436	1·46668	1·20941	1·31959	1·1466	41	2·72540	3·43334	2·92046	2·93421	2·7099
12	1·30006	1·48363	1·24748	1 35209	1·1864	42	2·82697	3·56947	3·01531	3·04228	2·8191
13	1·33034	1·50748	1·28762	1·38295	1·2274	43	2·93374	3·71163	3·11438	3·15611	2·9361
14	1·35701	1·53689	1·32995	1·41275	1·2684	44	3·04755	3·85961	3·22556	3·27618	3·0602
15	1·38152	1·57042	1·37464	1·44215	1·3084	45	3·16953	4·02243	3·32613	3·40302	3·1917
16	1·40564	1·60653	1·42185	1·47173	1·3462	46	3·30065	4·17206	3·43929	3·53729	3·3308
17	1·43115	1·64357	1·47174	1·50228	1·3806	47	3·44201	4·31512	3·55776	3·67973	3·4777
18	1·45809	1·68168	1·52350	1·53391	1·4124	48	3·59420	4·50613	3·68122	3·83358	3·6323
19	1·48653	1·72106	1·57621	1·56677	1·4424	49	3·75768	4·68414	3·80931	3·99137	3·7944
20	1·51649	1·76190	1·62891	1·60100	1·4716	50	3·93305	4·87185	3 94155	4·16193	3·9639
21	1·54804	1·80443	1·68057	1·63679	1·5011	51	4·13052	5·07148	4·07744	4·34353	4·1406
22	1·58126	1·84888	1·73004	1·67434	1·5319	52	4·32589	5·28577	4·21637	4·53732	4·3247
23	1·61618	1·89563	1·77793	1·71375	1·5643	53	4·53847	5·51633	4·35786	4·74421	4·5178
24	1·65281	1·94508	1·82488	1·75911	1·5985	54	4·76228	5·76527	4·50137	4·96553	4·7223
25	1·69122	1·99765	1·87159	1·79849	1·6348	55	5·01042	6·03468	4·64624	5·20282	4·9409
26	1·73142	2·05394	1·91883	1·84409	1·6734	56	5·27780	6·47550	4·79465	5·45813	5·1774
27	1·77349	2·11424	1·96730	1·89640	1·7147	57	5·56707	6·64938	4·93716	5·73443	5·4358
28	1·81774	2·17862	2·01737	1·94254	1·7589	58	5·87791	6·99748	5·08156	6·03090	5·7163
29	1·86458	2·24707	2·06932	1·99586	1·8062	59	6·20990	7·37117	5·22405	6·34725	6·0183
30	1·91441	2·31954	2·12238	2·04753	1·8552	60	6·56278	7·76910	5·36326	6·70497	6·3417
31	1·96769	2·39602	2·18023	2·11212	1·9158	61	6·93643	8·18965	5·49721	7 03903	6·6864
32	2·02491	2 47648	2·23994	2·17569	1·9746	62	7·33090	8 63148	5·62308	7·41322	7·0527
33	2·09096	2·56123	2·30273	2·24309	2·0375	63	7·73224	9 07664	5·73687	7·79264	7·4266
34	2·15625	2·65059	2·36869	2·31439	2·1047	64	8·11913	9·49866	5·83244	8·15635	7·7880
35	2·22543	2·74463	2·43790	2·38971	2·1762	65	8·62563	9·85462	5·89985	8·47051	8·1045
36	2·29847	2·84443	2·50472	2·46917	2·2523	66	8·68322	10·06941	5·92143	8·67569	8·3199
37	2·37536	2·95018	2·58048	2·55287	2·3331	67	8·68152	9·99570	5·86224	8·65501	9·3243
38	2·45635	3·06190	2·65983	2·64116	2·4188	68	8·20579	9·36487	5·54553	8·16599	7·8803
39	2·54171	3·17963	2·74285	2·73393	2·5099	69	6·52591	7·37269	4·45111	6·48469	6·2813

TABLE A.S.

Single and Annual Premiums for Sick Allowance of £1 per Week.

Age.	Payments and Benefits to cease at Age 70.				Benefits to continue through Life.			Age.
	Annual Premiums.				Payment to cease at 70.	Payment to continue through Life.		
	Highland* Society.	Ansell's Results.	Rural, Town, and City Districts, East and West.	Rural, Town, and City Districts, Scotland.	Annual Premium.	Annual Premium.	Single Premium.	
10	..	..	1·2852	1·1087	1·82418	1·78382	45 25344	10
11	..	..	1·3196	1·1466	1·88195	1·83861	46·25386	11
12	..	..	1·3521	1·1864	1·93829	1·89181	47·18935	12
13	..	..	1·3830	1·2274	1·99426	1·94444	48·08238	13
14	..	..	1·4128	1·2684	2·05051	1·99712	48·95686	14
15	..	..	1·4422	1·3084	2·10776	2·05055	49·83723	15
16	..	..	1 4717	1·3462	2·16677	2·10543	50·74952	16
17	..	..	1·5023	1·3806	2·22832	2·16251	51·72150	17
18	..	..	1·5339	1·4124	2·29264	2·22197	52·75021	18
19	..	..	1·5668	1·4424	2·35997	2·28403	53·83229	19
20	..	..	1·6010	1 4716	2·43056	2·34889	54·96356	20
21	0·9666	1·3479	1·6368	1·5011	2·50474	2·41681	56·13955	21
22	0·9917	1·3760	1·6743	1·5319	2·58281	2·48806	57·35479	22
23	1·0167	1·4070	1·7138	1·5643	2·66504	2·56285	58·61161	23
24	1·0458	1·4392	1·7591	1·5985	2·75802	2·64718	59·91067	24
25	1·0708	1·4731	1·7985	1·6348	2·84309	2·72383	61·25446	25
26	1·1000	1·5087	1·8441	1·6734	2·93954	2·81049	62·64415	26
27	1·1333	1·5463	1·8964	1·7147	3·04843	2·90800	64·08249	27
28	1·1667	1·5859	1·9425	1·7589	3·14919	2·99758	65·57331	28
29	1·2000	1·6277	1·9959	1·8062	3·26339	3·09875	67·11975	29
30	1·2417	1 6718	2·0475	1·8552	3·37675	3·19853	68·72624	30
31	1·2750	1·7184	2·1121	1·9158	3·51343	3·31850	70·39642	31
32	1 3167	1·7676	2·1757	1·9746	3·65061	3·43806	72·13488	32
33	1·3625	1·8195	2 2431	2·0375	3·79663	3·56451	73·94001	33
34	1·4125	1·8743	2·3144	2·1047	3·95202	3·69817	75·80993	34
35	1·4583	1·9320	2·3897	2 1762	4·11740	3·83937	77·74365	35
36	1·5167	1·9930	2·4692	2·2523	4·29348	3·98848	79·73958	36
37	1·5750	2·0574	2·5529	2·3331	4·47069	4·14592	81·79603	37
38	1·6333	2·1254	2·6412	2·4188	4·68104	4·31212	83·91558	38
39	1 6958	2·1972	2·7339	2·5099	4·89432	4 48791	86·09388	39
40	1·7667	2·2731	2·8315	2·6067	5·12214	4·67342	88·33321	40
41	1·8417	2·3532	2 9342	2·7099	5·36580	4·86948	90·63574	41
42	1·9208	2·4380	3·0423	2·8191	5·62690	5·07688	93·00194	42
43	2·0042	2·5277	3·1561	2·9361	5·90718	5·29642	95·43467	43
44	2·0958	2·6226	3·2762	3·0602	6 20876	5·52911	97·93764	44
45	2·1917	2 7232	3 4030	3·1917	6·53410	5·77602	100·51489	45
46	..	2·8300	3·5373	3·3308	6·88605	6·03842	103·17002	46
47	..	2·9435	3·6797	3·4777	7·26799	6·31773	105·90721	47
48	..	3·0645	3·8336	3·6323	7·68896	6·61524	108·73331	48
49	..	3·1936	3·9914	3 7944	8·13695	6·93230	111·65371	49
50	..	3·3318	4·1619	3·9639	8·63337	7·27064	114·67544	50
51	..	3 4800	4·3435	4·1406	9·17901	7·63205	117·80749	51
52	..	3·6393	4·5373	4·3247	9·78140	8·01875	121·05895	52
53	..	3·8107	4·7442	4·5178	10·44921	8·43265	124·43467	53
54	..	3·9958	4·9655	4·7223	11·19351	8·87629	127·93754	54
55	..	4 1963	5·2028	4·9409	12 02794	9·35235	131·57168	55
56	..	4·4139	5·4581	5·1774	12·96967	9·86389	135·34342	56
57	..	4·6505	5·7344	5·4358	14·04234	10·41527	139·26056	57
58	..	4·9085	6·0309	5·7163	15·27047	11·00733	143·29562	58
59	..	5·1903	6·3473	6·0183	16·68888	11·64210	147·42162	59
60	..	5·4990	6·7050	6·3417	18·40498	12·34866	151·61214	60
61	..	..	7·0390	6·6864	20·30792	13·04968	155·83668	61
62	..	..	7·4132	7·0527	22·67034	13·82718	160·06755	62
63	..	..	7·7926	7·4266	25·56717	14·65102	164 23507	63
64	..	..	8·1564	7·7880	29·20809	15·51609	168·26433	64
65	..	..	8·4705	8·1045	33·94406	16·41560	172 08306	65
66	..	..	8·6757	8·3199	40·40871	17·34150	175·61910	66
67	..	..	8·6550	9·3243	49·87166	18·28333	178·78889	67
68	..	..	8·1660	7·8803	65·32729	19·23611	181·59549	68
69	..	..	8·4847	6 2813	95·76302	20·19314	184·04026	69

* This column presumes on money bearing interest at 4 per cent. per annum, and consists of the reciprocals of the quantities given at page 236 of the Highland Society's Report. The other columns are calculated at 3 per cent., as explained in the text.

England and Wales.—Whole Population.—Three per Cent.—Males and Females.

Age.	Value of Annuities of £1.		Single Premium for £1 at Death.		Annual Premium for £1 at Death.		Age.	Value of Annuities of £1.		Single Premium for £1 at Death.		Annual Premium for £1 at Death.	
	Males.	Females.	Males.	Females.	Males.	Females.		Males.	Females.	Males.	Females.	Males.	Females.
10	23·11227	23·14338	·29770	·29679	·01235	·01229	58	11·38827	11·98749	·63918	·62172	·05160	·04787
11	22·99545	23·02800	·30110	·30015	·01255	·01249	59	11·03421	11·62663	·64949	·63224	·05397	·05007
12	22·85265	22·89028	·30526	·30417	·01280	·01273	60	10·67861	11·26347	·65985	·64281	·05650	·05242
13	22·68828	22·73433	·31005	·30871	·01309	·01301	61	10·32147	10·89617	·67025	·65351	·05920	·05493
14	22·50725	22·56764	·31532	·31357	·01341	·01331	62	9·96440	10·52557	·68065	·66430	·06208	·05764
15	22·31543	22·38900	·32091	·31877	·01376	·01363	63	9·60720	10·15327	·69105	·67515	·06515	·06053
16	22·11918	22·21132	·32663	·32394	·01413	·01396	64	9·25149	9·78209	·70141	·68596	·06842	·06362
17	21·92528	22·03870	·33227	·32897	·01449	·01428	65	8·89699	9·41209	·71174	·69673	·07192	·06692
18	21·73428	21·87023	·33784	·33388	·01486	·01460	66	8·54558	9·04511	·72197	·70742	·07563	·07043
19	21·54610	21·70490	·34332	·33869	·01533	·01492	67	8·19602	8·68050	·73216	·71804	·07962	·07417
20	21·36038	21·54070	·34873	·34347	·01560	·01524	68	7·84976	8·31957	·74224	·72855	·08387	·07817
21	21·17461	21·37586	·35414	·34828	·01597	·01557	69	7·50606	7·96177	·75225	·73898	·08844	·08246
22	20·98913	21·20815	·35954	·35316	·01635	·01590	70	7·16642	7·60903	·76214	·74925	·09333	·08703
23	20·80300	21·03800	·36496	·35812	·01674	·01625	71	6·83048	7·26065	·77193	·75940	·09·58	·09193
24	20·61646	20·86560	·37039	·36314	·01714	·01661	72	6·50013	6·91893	·78155	·76935	·10421	·09715
25	20·42957	20·69063	·37584	·36824	·01754	·01698	73	6·17497	6·58320	·79102	·77913	·11025	·10274
26	20·24140	20 51300	·38132	·37341	·01795	·01736	74	5·85700	6·25542	·80028	·78868	·11671	·10870
27	20·05073	20·33263	·38687	·37866	·01838	·01775	75	5·54513	5·93475	·80937	·79802	·12366	·11507
28	19·85678	20·14938	·39252	·38400	·01882	·01816	76	5·24219	5·62337	·81819	·80709	·13413	·12185
29	19·65875	19·96300	·39829	·38943	·01928	·01858	77	4·94773	5·32100	·82677	·81589	·13901	·12908
30	19·45529	19·77275	·40421	·39497	·01976	·01901	78	4·66492	5·02946	·83500	·82438	·14740	·13673
31	19·24592	19·57900	·41031	·40061	·02027	·01947	79	4·39401	4·74776	·84289	·83259	·15627	·14485
32	19·03114	19·38100	·41657	·40638	·02080	·01994	80	4·13709	4·47790	·85037	·84045	·16554	·15343
33	18·80978	19·17900	·42302	·41226	·02135	·02043	81	3·89182	4·21856	·85752	·84800	·17530	·16250
34	18·58228	18·97000	·42964	·41835	·02194	·02095	82	3·65952	3·97062	·86429	·85523	·18549	·17206
35	18·34839	18·76000	·43645	·42446	·02256	·02148	83	3·44548	3·73255	·87052	·86216	·19582	·18218
36	18·10807	18·54214	·44345	·43081	·02321	·02205	84	3·22525	3·50576	·87693	·86877	·20754	·19282
37	17·86131	18·31820	·45064	·43733	·02389	·02264	85	3·02174	3·28766	·88286	·87512	·21953	·20410
38	17·60807	18·08791	·45802	·44404	·02461	·02326	86	2·82919	3·08074	·88847	·88114	·23203	·21593
39	17·34854	17·85051	·46558	·45096	·02537	·02392	87	2·64670	2·88456	·89379	·88686	·24510	·22833
40	17·08318	17·60569	·47331	·45809	·02617	·02462	88	2·48467	2·70072	·89850	·89221	·25784	·24110
41	16·81151	17·35314	·48122	·46544	·02702	·02536	89	2·32768	2·52868	·90308	·89722	·27138	·25427
42	16·53416	17·09300	·48930	·47302	·02791	·02614	90	2·18378	2·37019	·90727	·90184	·28497	·26759
43	16·25092	16·82518	·49755	·48082	·02884	·02695	91	2·05148	2·22344	·91112	·90611	·29858	·28110
44	15·96232	16·54983	·50595	·48881	·02983	·02785	92	1·93051	2·08767	·91465	·91007	·31212	·29474
45	15·66814	16·26662	·51452	·49709	·03087	·02879	93	1·82362	1·96234	·91776	·91372	·32503	·30845
46	15·36847	15·97685	·52325	·50553	·03197	·02978	94	1·72831	1·84522	·92053	·91713	·33740	·32234
47	15·06305	15·67908	·53214	·51420	·03313	·03083	95	1·64619	1·73887	·92293	·92023	·34878	·33599
48	14·75208	15·37431	·54120	·52308	·03436	·03195	96	1·57820	1·63942	·92491	·92312	·35874	·34975
49	14·43551	15 06224	·55042	·53217	·03566	·03313	97	1·52180	1·54631	·92646	·92584	·36694	·36360
50	14·11352	14·74322	·55980	·54146	·03704	·03439	98	1·48815	1·46233	·92753	·92828	·37277	·37700
51	13·78608	14·41713	·56934	·55096	·03851	·03574	99	1·43605	1·38359	·92905	·93057	·38137	·39040
52	13·45425	14·08456	·57900	·56064	·04006	·03717	100	1·36660	1·29352	·93107	·93320	·39342	·40689
53	13·11804	13·74564	·58880	·57052	·04171	·03869	101	1·34601	1·18638	·93167	·93632	·39713	·42825
54	12·77812	13·40139	·59870	·58054	·04345	·04031	102	1·23955	1·07204	·93477	·93965	·41738	·45350
55	12·43500	13·05178	·60869	·59072	·04531	·04204	103	1·07469	·95359	·93999	·94310	·45307	·48275
56	12·08888	12·69900	·61877	·60100	·04727	·04387	104	·77105	·82410	·94841	·94687	·53549	·51909
57	11·73952	12·34450	·62895	·61133	·04937	·04581	105	·32363	·48544	·96145	·95674	·72639	·64410

Annuities, although not in so marked a degree, nor to the same extent as in the simple Mortality Tables. If money made no interest, it is plain that the value of Annuities, and the numerical expression in the Expectation Tables or Mortality Tables of Collective Intensity, would be identical, and under that aspect Annuities would have a maximum value. Again, if money could realise an infinite amount of interest, Annuities would then be at a minimum value, and have the same expression for every Table of Mortality and every age in those Tables. To illustrate this, suppose money could realise 100 per cent., or always double or replace itself in the course of a year; and starting with unity, before the expiration of the first term of the annuity a new fund would have formed itself capable of meeting the annuity, and leaving exactly the original unit with which the start was made, ready to enter on the second term of the annuity in the same manner, and so on *ad infinitum*. Under such an aspect, no matter what Table of Mortality was employed, the values of annuities would differ but little, as unity would invariably be capable, from the interest realised only, of meeting every payment for an absolute term of years. It is therefore evident that the values of annuities involving the discount of money will always shew less distinction between different Tables of Mortality than the Tables themselves will shew; and that the higher the rate of interest, the less distinction is observable between the annuities of different Tables, as well as less difference between the values of annuities at various ages for the same Mortality Table.

On reference to page 37, it will be seen that the difference of Expectation between the Rural and City Districts at age 30 is 14·442 per cent.; but a comparison of the values of Annuities at that age for the same Districts, as given at page 470, will shew a difference of only 9·729 per cent. The following Abstract will give a concise view of the relative values of the two expressions:—

Age.	Expectation of Life in		Excess per cent. in favour of Rural Districts.	Value of Annuities Three per Cent.		Excess per cent. in favour of Rural Districts.
	Rural Districts.	City Districts.		Rural Districts.	City Districts.	
20	45·3550	40·0148	11·774	22·78605	21·29054	6·563
40	30·9724	26·0873	15·772	18·60452	16·45861	11·534
60	16·6524	13·7685	17·318	11·85797	10·18722	14·090

Again, for reasons precisely similar, less distinction will be found to exist between the values of Annuities for various ages in the same Table, than between the Expectations of Life for those ages; for example, the difference of Expectation between ages 30 and 60 in the Rural Districts is 21·7549 years, or nearly 57 per cent.; but the difference between the values of Annuities for those ages in the Rural Districts is 9·2097, or about 44 per cent. Like results will also be found for other ages, no matter what Table of Mortality

be employed: taking the general results for the Three Districts for ages 50 and 70, the difference of Expectation will be found to be 11·9863 years, or about 54 per cent.; but the difference in the values of the Annuities for those ages is 7·1460, or 46 per cent. The difference in this instance is however less than in the former, on account of more proximate and more advanced ages being taken; but with ages less proximate and less advanced, the difference will exceed that in either of the preceding cases. Let ages 10 and 50 in the Rural Districts be compared, and the difference of Expectation will be found to be 56 per cent., but the difference in the value of Annuities is only 37 per cent.

From these remarks respecting the relative values of Annuities, and the Expectation of Life in various Mortality Tables, it is not to be considered that practically it is a matter of indifference which Table may be used as a basis for calculations for the guidance of a Society. The objects of these remarks is intended to lead to quite the opposite conclusion, and to prevent those who are not thoroughly conversant with such subjects from hastily adopting any given Table, simply because the money test, by which it is generally brought into comparison with other Tables, shews but little difference. The success of every friendly society, and other Institution dealing in Life Contingencies, depends in a great measure on the proper investment of its funds; and although Annuities by two different Mortality Tables may apparently approximate to nearly equivalent values, still, before all the conditions of each Table are practically determined, the accumulation of interest as presumed on in the construction of the Tables, will ultimately realise the maximum difference which is found to prevail between the Expectation of Life for the respective Tables.

The following are the values of Annuities at 3 per cent. as given at page 470, and also according to the Carlisle Table, Mr. Ansell's Table, and the Northampton Table.

Age.	England and Wales.				Scotland.	Carlisle.	Ansell.	North-ampton.	Age.
	Rural Districts.	Town Districts.	City Districts.	Rural, Town, & City Districts.	Rural, Town, & City Districts.				
20	22·78605	22·18086	21·29054	22·39981	22·04167	21·694	20·4602	18·6385	20
40	18·60452	17·01150	16·45861	17·90117	17·56000	17·143	15·6673	14·8476	40
60	11·85797	10·12786	10·18722	11·27757	11·18877	10·391	9·8583	9·7774	60

To those desirous of inquiring minutely into the relative values of Annuities for the different Tables given in this paper, and the Tables of Mortality hitherto in use, a careful consideration of their respective bearings will be important; for as Annuity Tables are the foundation on which all the subsequent Monetary Tables are built, their peculiarities must affect the whole structure. This will be clearly seen on inspection of the Table

for Deferred Annuities at page 471. According to that Table, at age 30 the value of a Deferred Annuity of £1 per annum, to commence forty years hence or on attaining age 70, is, for the Rural, Town, and City Districts, 1·13398, and the value of the same sum according to Mr. Ansell's Table is only ·6764. This is a most remarkable distinction, and of vital importance to friendly societies; for although the present results for age 30 shew an excess of value in simple or Immediate Annuities of less than 13 per cent. above those given by Mr. Ansell, yet in the Deferred Annuity at the same age there is an excess of 69 per cent. It is under such circumstances as these, where the improvement of money at interest magnifies results, that serious blunders in the adoption of an erroneous Mortality Table will be apt to prove hurtful to the interests of a Society.

Few friendly societies granting Deferred Annuities have yet survived long enough to suffer from the effects of so serious an error; but the above illustration points out the inevitable ruin which must overtake those societies at present granting Deferred Annuities; as very few of them exact terms even so favourable as are required by Mr. Ansell's Tables. A further illustration of this question, and of the manner in which the peculiar result is produced, may be obtained by reference to Table F, page 32. It will be seen, that of 89,360 persons living aged 30, 42,367 attained their 70th year of age; that is to say, out of 100 entering a friendly society at 30 years of age, and purchasing Deferred Annuities, 47 would be alive at 70 years of age, to be placed on the Annuity List; but Mr. Ansell's Table would provide for only 33 of the 47 persons becoming Annuitants. Or more correctly, out of every 1000 members entering those societies at age 30, there would be 147 Annuitants unprovided for; that is to say, 45 per cent. more Annuitants would have claims, than would be calculated on by Mr. Ansell's data, who would therefore be left destitute of any provision for old age.

The melancholy spectacle which such a state of things would produce can be readily imagined. Supposing that at the present time there are only one million members of friendly societies, (which is much under the correct estimate,) whose average age is about 30, and presuming that the terms for Deferred Annuities are graduated according to the preceding hypothesis, 470,000 of those persons would attain the age of 70, and nearly one-third would be without any provision for old age. This is only one of the many evils connected with the present condition of friendly societies; and although its visitation be more remote, the awful consequences of such a calamity, like every other evil of procrastination, will be irreparable.

At page 472 will be found the value of Temporary Annuities to continue till age 70; and from what has been said respecting Immediate Annuities absolute for Life, and Deferred Annuities, it must be evident that Temporary Annuities will also partake of the same relative character as the other Annuity Tables referred to.

Since it has been shewn that, according to the results of this inquiry, Annuities are of greater value than that which is given in many other Tables, it must follow that the

value of Assurances, or sums payable at death, are of less value. An inspection of the Table at page 473 will shew that at age 30 the value of £100 payable at death is £35 14*s.* 6*d.* in the Rural Districts, £39 5*s.* 11*d.* in the Town Districts, £41 13*s.* 9*d.* in the City Districts, £37 8*s.* 4*d.* in the Three Districts combined, and £38 13*s.* 6*d.* according to the value of Life in Scotland; while, according to the Carlisle Table of Mortality, the value of the same sum would be £40 2*s.* 7*d.*, by Mr. Ansell's Table £44 2*s.* 7*d.*, and by the old Northampton Table as much as £47 16*s.*

Again: the annual premium at age 30 for an Assurance of £100 at death will, according to the Table at page 474, be £1 12*s.* 5*d.* for the Rural Districts, £1 17*s.* 9*d.* for the Town Districts, £2 1*s.* 8*d.* for the City Districts, £1 14*s.* 1*d.* for the Three Districts combined, and £1 16*s.* 9*d.* for Scotland; but the annual premium according to the Carlisle Table is £1 19*s.*, by Mr. Ansell's Table £2 17*s.* 1*d.*, and by the Northampton Table £2 13*s.* 4*d.* Nothing beyond the most general view of the various Tables is proposed to be here taken, as the remarks formerly made respecting the Tables of Mortality themselves will point out the various modifications which the results must undergo in their application to monetary purposes.

At page 475 will be found the Temporary Annual Premiums payable until age 70, to assure a sum payable at death, whenever that may happen, for each of the Districts. And at pages 476 and 477 will be found the probabilities of living for one year and of dying in one year for each District. As these form elements in the calculations of the rates or premiums for Allowances during Sickness, they are inserted simply as a check upon the calculations.

The next Table to be brought under notice is that at page 478, which represents the single premium necessary to provide an allowance of £1 per week during sickness or incapacity for labour up to the age of 70. All the Tables here given are meant to be illustrative of the true bearings and risks of friendly societies; and the age of 70 has been fixed on in the present instance, and in the other Tables of Temporary Premiums, because it is an age usually adopted in calculations for friendly societies, and will therefore admit of easy comparison with other results on the same subject.

As no attempt has been made in this paper to enter into the general principles of Vital Statistics, or to discuss the methods and formulæ most applicable to questions of Life Contingency, those desiring information on such points had better consult the standard works on the subject; but as the calculations in reference to the benefits offered by friendly societies are limited to the term of 70 years of age, and as it will be necessary in practice to have Tables for other terms of life, Tables in a different, and for many purposes a more convenient, form will be found in a subsequent page. However, it may be desirable for reference to give the formulæ by which the results at page 478 were obtained.

Let s = the average amount of sickness to each individual for the year immediately following any given age, as given in Table V;

$v^{\frac{1}{2}}$ = the present value of £1 due six months hence; and

Let $s \times v^{\frac{1}{2}} = x$; also let

p = the probability of a life of the given age living one year; and

v = the present value of £1 due one year hence; and

Let $p \times v = y$; then if

z is made to represent the present value of £1 per week during sickness, from any given age up to an older age—say 70, the successive values for the z representing each age are found under the following expression:—

$$\lambda z_n = (\lambda z_{n-1} + \lambda y_n) + \lambda x_n$$

And if θ is made to represent the terms at the respective ages in page 472,

$\lambda z_n - \lambda (1 + \theta)$ will give the logarithm of the annual premium for an allowance of £1 per week during sickness or incapacity for labour, as set forth in the Table at page 479. In that Table both the annual premium and the benefits are understood to cease on attaining 70 years of age, or sooner in the event of death.

The Tables referred to are calculated on the supposition that the various payments are to be made annually; but it is well known that friendly societies rarely make any payments at so remote periods. For strictly practical purposes, Tables involving the consideration of annuities payable in monthly or weekly instalments would be better fitted; but as the object of this paper is to furnish data illustrative of the condition of those societies, and of the nature and extent of the risks undertaken by them, as well as to give practical details for their guidance, further Tables have been inserted.

It is obvious from the remarks already made in regard to Table V, that the premium for an allowance in sickness, according to the results of this inquiry, must be higher than those of former Tables. As Mr. Ansell's information on this subject is the most deserving of attention, any comparison will be limited to the values given at pages 133 and 134 in his interesting treatise. At age 30 the value of £1 per week during sickness, up to attaining age 70, is £30·0958; but according to the results at page 478, it is £39·7176 for the Rural Districts; £46·3904 for the Town Districts; £40·8181 for the City Districts; £41·6730 for the Rural, Town, and City Districts combined; and £37·0322 for Scotland. These, although shewing a very great difference from the values given by Mr. Ansell, are still not greater than might be expected after a careful consideration of Table V, and the remarks made in the preceding pages on that Table. It has been stated that the values of annuities calculated from different mortality Tables will always shew less difference than the mortality Tables themselves; but the same feature does not present itself in connection with sickness Tables. Two different Tables on the plan

of Table V might indicate precisely the same ratio of sickness at each age, and yet the value of a sick allowance calculated for the one Table might differ widely from that for the other.

In the annuity Tables two elements only affected the results—the rate of mortality and the rate of interest; but three elements affect the sickness Tables—the rate of mortality, the rate of interest, and the rate of sickness. It has been shewn that the rate of mortality does not necessarily increase with an increase in the rate of sickness; and therefore two classes of the population may be influenced by the same or nearly the same degree of sickness, and yet be subject to very different rates of mortality. Keeping this in view—suppose there are two sickness Tables, A and B, having the same or nearly the same rate of sickness at each age; but that the population of Table A is subject to a high rate of mortality compared to Table B,—it is evident, that although each individual of the same age in both Tables would in the course of the same year of life experience the same degree of sickness, yet each person under Table B would be subject to a greater amount of sickness over the whole duration of his life, and for the simple reason, that his expectation of life is greater. Take any number of persons—say 100, on the former Table at 30 years of age, and suppose their expectation, or for greater exactitude, their equation of life, to be 30 years; one-half only of those lives would live to attain 60 years of age; but if on the other Table the equation of life were 40 years, one-half of the same number would not be dead till 70 years of age, a considerable portion of which would be subject to an increased ratio of sickness in the decennial period following age 60. It happens that there is an actual case in point to illustrate this hypothesis. The Rural Districts of England and Wales, and the average results for all Scotland, shew almost exactly the same amount of sickness in the aggregate over the whole period of forty years from age 30 to 70, differing by less than two-tenths of a weeks' sickness; the amount in the

Rural Districts of England and Wales being . . . . . 121·1448 weeks
And in the whole of Scotland . . . . . 121·3164 ...

But the equation of life for the former at age 30 will be found at page 100 to be 40·813 years, while for the latter it is only 37·478 years, being a difference of 3·335 years. And therefore, although there is no greater amount of sickness in the Rural Districts of England and Wales than in Scotland generally, still the value of a sick allowance in the former is greater than in the latter. At page 478 it will be found that at age 30, the single premium for a sickness allowance of £1 per week, to cease at age 70, is in the

Rural Districts of England and Wales . . . . . £39·7176; but for
The whole of Scotland only . . . . . £37·0322

It is therefore evident that the rate of sickness is not of itself a sufficient index to the rates

of premium that may be deduced therefrom. At page 415 it was shewn that the excess of sickness in the present results above those quoted by Mr. Ansell was 21 per cent., but the values for sick allowance, quoted in the preceding page, shew a difference of above 31 per cent. The feature, therefore, which was characteristic of annuity Tables—of approximating nearer to equivalent values than the mortality Tables from which they were deduced—does obviously not distinguish sick allowance Tables.

There is another feature connected with Tables of the rates of sickness, which will affect their money-values, independently of the influence of the rates of mortality, and that is the graduation or distribution of sickness over the various periods of life. It might happen that two sickness Tables gave the same amount of sickness within a given period of years, but that in the one Table it was more uniformly spread over the various terms of life; not shewing, as in the other Table, a very low rate of sickness at the younger ages, and a very high rate at advanced ages. This circumstance, although the rate of mortality in both Tables were the same, would occasion a difference in the value of sick allowances—and for two reasons; first, because the bulk of the sickness in the one Table was deferred till the advanced ages, those persons dying before reaching those ages would experience a minimum amount; and second, because the money liabilities also being deferred, the early premiums would by longer investment accumulate to a greater sum. An inspection of the second Abstract, given on page 413 and the Table on page 415, will shew that such a relation exists between Mr. Ansell's Table and the general results of this inquiry; the sickness in his Table being more uniform, and shewing less disparity for the various ages, while the Highland Society Table runs almost parallel over the whole term of life, from 20 to 70 years of age, with the results for the three Districts.

The following Abstract will shew the comparative values of an allowance of £1 per week in sickness up till age 70:—

Age.	Mr. Ansell's Table.	England and Wales.				Scotland.	Age.
		Rural Districts.	Town Districts.	City Districts.	Three Districts combined.	Three Districts combined.	
20	27·0881	34·68519	39·80233	35·41518	36·20420	32·7979	20
30	30·0958	39·71760	46·39042	40·81807	41·67304	37·0322	30
40	34·3204	46·56296	55·56052	46·00568	48·83092	44·1712	40
50	38·7078	53·45831	62·31153	50·16440	55·28222	51·8728	50
60	39·2316	55·15634	61·85428	42·69764	55·23260	51·5541	60

The important effect of the above differences on the stability and permanence of a society is obvious. The distinction which has been observed in respect of single payments or premiums, will also be found to prevail in the annual premiums, as given at page 479: and the following Abstract will give a general idea of the merits of the various Tables.

The annual premium, as well as the sick allowance, will in this case also terminate on attaining 70 years of age.

Age.	Mr. Ansell's Table.	England and Wales.				Scotland.	Age.
		Rural Districts.	Town Districts.	City Districts.	Three Districts combined.	Three Districts combined.	
20	1·3206	1·51649	1·76190	1·62891	1·60100	1·4716	20
30	1·6718	1·91441	2 31954	2·12238	2·04753	1·8552	30
40	2·2731	2·63176	3·31129	2 82968	2·83154	2·6067	40
50	3·3318	3·93305	4·87185	3·94155	4·16193	3·9639	50
60	5·4990	6·56278	7·76910	5·36326	6·70497	6·3417	60

The preceding observations will be sufficient to point out the leading features of the sickness Tables, and to suggest the proper modes of application to the practical uses of friendly societies. It is not expected that the present paper will obtain anything like a general circulation among the members of those societies, or a different style and mode of treating the subject would have been adopted. All that has been contemplated is such an exhibition of the facts and data as will afford a means of determining the various contingent risks on which the liabilities of friendly societies depend in such a manner as to be intelligible to those taking an interest in vital statistics ; but as, in addition to the prizes given, as mentioned at page 17, a further inducement was held out to parties furnishing data, by a promise to publish the results, and present copies to every contributor of data ; the following remarks were added bearing on the present condition of friendly societies.

One of the difficulties in the way of obtaining information was the fear, on the part of the members, that its publication might prove hurtful to particular societies ; and it was therefore necessary to promise, that whatever use was made of the information, no individual society should be referred to. But that a general idea may be formed of the condition of friendly societies, in respect to the adequacy of their contributions for the benefits held out by them, fifty societies have been selected at random ; and in order to make the illustration more simple, one period of life only, age 35, has been fixed on, and the rates in each of the fifty societies in question examined and graduated to represent an allowance of £1 per week during sickness, up to age 70—an annuity of £13 per annum for life after 70—and a sum of £10 payable at death, whenever that may happen. The corresponding rates having been determined in each society for the above scale, they were found to average only £1 11*s.* 5*d.* ; but in many of the societies an entry money is paid, and for the same age it was found to average £1 1*s.* 9*d.* As the value of the temporary annuity at the same time of life is 17·88172, the above entry money will be equivalent to an annual contribution of about 1*s.* 3*d.*, which, added to the other item, will render the

whole annual contribution £1 12*s.* 8*d.* The entire inadequacy of such a contribution to provide for the benefits offered must be apparent. Page 479 will shew, that for the single benefit of £1 weekly, during sickness, the annual contribution should be £2 7*s.* 9½*d.*; and on examination of the respective Tables it will be seen that the contribution adequate to provide for the three benefits offered is £3 7*s.* annually, or more than double the actual amount collected. This is a most lamentable condition in which to find societies aiming at designs so benevolent and praiseworthy. It may seem strange that they should endure for even a year or two; but if the amount of sickness at page 415 be examined, and the young period of life at which members generally enter be borne in mind, it will appear that they may survive at least 25 or 30 years before their insecurity becomes evident to an ordinary observer. Members are generally satisfied, in the first periods of a society, to find that the income has exceeded the expenditure and left a respectable balance, losing sight of the great accumulations which are necessary to meet the future liabilities incidental to their increasing years and infirmities. As a society advances, its income, in connection with a given number of members entering at a particular age, will invariably decrease with the increase of its expenditure. Suppose a society to commence with a given number of members, all 35 years of age; in 25 years afterwards, the income from those members, through the deaths that take place in that period, will have decreased to seven-tenths of its original amount; while its expenditure on sickness will have tripled, and the members will be fast approaching a time of life at which the expenditure will be ten times the original sum. This is a state of things for which the contributions of a society should make ample provision; but, unfortunately, few have so considered the subject as to prepare themselves for such vicissitudes.

But perhaps the most simple and correct mode of looking at the liabilities of those societies is to consider the most improved class of them, in which separate contributions are made for each benefit offered; and in this instance also the contributions answering to age 35 only will be spoken of.

No doubt societies may seriously err by having badly graduated Tables; and it might happen that the contributions at one period of life are abundant, while at other periods they may be quite inadequate; but as a very general view only is to be here taken of the subject, reference is made to the Tables themselves for information on the graduation of rates.

A distinction in the contributions for the various benefits offered, is a valuable improvement in the management of such societies; and accordingly collateral improvements accompany it; for in this class of societies it is found that the annual contribution for a sickness benefit only is nearly equal to that of the other group of societies referred to for the whole three benefits. To secure £1 per week during sickness, the contribution is £1 10*s.* 10*d.* yearly, which is only 1*s.* 10*d.* less than the yearly contribution in the other societies for all the benefits combined; but it has already been shewn, that the real

risk incurred from sickness by members entering at age 35, would require a payment of £2 7*s.* 9½*d.* annually.

No doubt many societies are on a much better foundation than the above statement would seem to indicate; but it has been thought the better course to refer to the societies as a class. A subdivision, however, of the same group was found in a better condition, and the annual payment was about £2 for £1 per week in sickness. No society had its sickness contributions equal to the rates in the preceding Table; but the payments in one society were much more than in the others, having been £2 6*s.* 11*d.* annually. The necessity for a general revision of the sickness rates and contributions in friendly societies is therefore obvious.

With respect, however, to those societies distinguishing the rates of contributions for sums of money payable at death, or what is generally termed assurances at death, a better state of things is found to exist. The contribution, on the average, of those societies is 4*s.* 7*d.* annually for £10 payable at death, while the exact risk, according to page 474, requires a payment of 4*s.* 0½*d.* This latter sum does not include anything for expenses of management. If it were the practice for those societies to keep distinct funds for each of the benefits offered, and never to allow the contributions for assurances at death to be mixed up with the monies arising from other sources, little danger need be feared by those making a provision for death; but, unfortunately, such a separation of the funds is rarely observed, and the general result is, that the assurance fund is absorbed by the deficiencies in the other business of the society. It may be here necessary to remark, that although the preceding sum is, on the average, quite adequate to meet the contingencies from death of all societies, yet there are societies in particular localities, the members of which follow unhealthy occupations, and, in those instances, such a sum would not be sufficient to meet all the liabilities from death.

The most remarkable deficiency yet observed, even among those societies that have graduated rates as well as distinct contributions for the various benefits offered, is in the contributions which provide for an annuity after attaining a given age. At page 471 will be found the values of deferred annuities, to commence at age 70; and the annual premium for the same annuity may easily be obtained from the expression—

$$\frac{\delta}{1+\theta}$$

in which δ represents the terms found at the respective ages on page 471, and θ the corresponding terms in the Table on page 472. Accordingly, at age 35, the annual contribution or premium for an annuity of £13 a-year after attaining the age of 70 is 18*s.* 10*d.*; but the rate in some societies is as low as 8*s.* 11*d.*, and an average of a number of the best societies is 12*s.* 2¾*d.*, while the most favourable rate in any individual society, in the

same group, was 14*s.* 4½*d.* The nature of this risk has already been referred to at page 484, and the remarks there made should be carefully considered by every one interested in the progress of friendly societies, as no error carries with it such distressing and melancholy consequences as that which aggravates the cares, anxieties, and infirmities of old age, and in the decline of life leaves those destitute whose youthful industry enabled them to live in comparative independence.

Another feature which particularly marks the older class of friendly societies, and which deserves attention, is a want of graduation in the premiums or rates of contribution. This feature, although generally associated with inadequate rates, is not of itself evidence of instability, but is rather a principle which is non-equitable to the members. The better constituted friendly societies have long discontinued such a plan, and have now Tables graduated according to age; but as there are still many societies not so improved, it is proposed to add a few observations on the nature of this error, which is most strikingly developed in the management of Odd Fellow Societies.

For example, one member with another, in passing from 20 to 30 years of age, will experience about 8½ weeks' sickness during the ten years, but in passing from 60 to 70 years of age, he will be subject to above 77 weeks' sickness, and in the ten years immediately following age 70, he would experience 205 weeks' sickness. This gradual increase of sickness with an increase of age, cannot fail to demonstrate that it would be anything but equitable to admit members at every period of life on the same terms. Viewed as a money question, it will be seen, (Table A Q) that at age 20, the sum of £36 4*s.* 1*d.*, paid down, would provide £1 a-week during sickness up till age 70, but that, at age 40, £48 16*s.* 7½*d.* would be necessary; and, therefore, if it were the practice of lodges to admit members at those ages, on equal terms, the older members must be supported, to a great extent, at the expense of the younger. A similar relation will be found to prevail with regard to the provisions for allowances at death.

If the money values for the preceding benefits were determined according to the experience of the members of the Manchester Unity itself, they will be found not to differ very widely. It has already been stated with regret, that Mr. Ratcliffe, in calculating his monetary tables, employed the Odd Fellow data beyond the age of 65, though they were evidently defective subsequent to that age, from the very small number of persons over whom the observations were made: and as the data for the twenty years preceding that period, approximate in a very remarkable manner to the results in these Contributions, there is every reason to believe, that if after the age of 65, the data of the Odd Fellows' experience had been sufficiently ample, an equally close approximation would have shewn itself. At all events the data in this Work, in the advanced stage of life, being of forty times the magnitude, should, seeing that the other is obviously defective, be used in preference. In constructing the following Tables, therefore, to

determine the money values for the different benefits described, the rate of sickness as actually experienced by the Unity, between ages 40–65, is taken from Mr. Ratcliffe's Table VII, page 19, and, subsequent to that age, from Table E, pp. 26–7 *ante*. Again, under the age of 40, the somewhat reduced ratio of sickness shewn in the returns of the Unity, must, on a careful consideration of the preceding remarks, be regarded as a temporary feature connected with the experience of the Order, as there are the strongest reasons to believe that should the different lodges become more stable, and cease to be agitated by the questions which have caused so much discussion during the last five or six years, the diminished fluctuation of members, at the younger ages, must have the effect of producing a higher ratio of sickness at the earlier periods of life, equalling, if not exceeding, that shewn in Table E. Hence, in constructing the following Table A U, the ratio of sickness for ages under 40 are the same as in Table E. There is, however, another element which enters into the consideration of this Table, viz. the rate of mortality. By the following Abstract it will be seen that the rate of mortality among the members of the Unity is intermediate between that for the whole population of England and Wales, and that for friendly societies in general. The following are the results for the different classes:—

Age.	Mortality per Cent. deduced from the data for		
	England and Wales whole population, Table C.	Manchester Unity, Ratcliffe, pp. 19—20.	Friendly Societies, Table F.
21 to 25	·876	·7561	·6838
26 ... 30	·998	·8058	·7295
31 ... 35	1·063	·8788	·7966
36 ... 40	1·157	·9340	·8786
41 ... 45	1·319	1·2259	1·0287
46 ... 50	1·560	1·4818	1·2571
51 ... 55	1·935	2·1849	1·6812
56 ... 60	2·529	2·8282	2·2249
61 ... 65	3·474	4·5826	2·9262
66 ... 70	4·947	6·8571	4·4885
71 ... 75	7·243	6·7961	7·0928
76 ... 80	10·924	9·5237	8·5140
81 ... 85	16·206	12·5000	12·5874

From the above Abstract it will be seen that the rate of mortality under the age of 50 is, in the Manchester Unity, intermediate between the two other classes, but from that age to 70, the rate is higher; it consequently follows that, so far as the experience of the Unity extends, the members are subject to a rate of mortality differing from the other two. It has already been stated that, after the age of 65, the Odd-Fellow data is too limited to be relied on in regard to sickness, and the same observation applies with greater force in respect to mortality.

In constructing the following Table, therefore, the actual rate of mortality observed in the Manchester Unity, up to the age of 65, will be taken, but, after that age, a rate intermediate between the other two classes of results.

It is unnecessary here to enter into the details of the method followed in order to determine from the preceding facts the rates of mortality and sickness for specific ages, and to construct the preliminary Tables thence arising, preparatory to the formation of the following Table. Those wishing to follow up that part of the question, will find the methods fully explained and exemplified in the Contribution on the Rate of Mortality among Persons of Intemperate Habits, pp. 206–17 *ante*.

TABLE A U.

Age.	D.	N.	D^s	N^s	Age.	D.	N.	D^s	N^s
15	64186	1454957	50210	2937975	58	10894	119385	37393	1371311
16	61966	1392991	49328	2887765	59	10277	109008	36836	1333918
17	59792	1333199	48304	2838437	60	9629·2	99478·6	37502	1297082
18	57669	1275530	47100	2790133	61	8977·0	90501·6	39074	1259580
19	55602	1219928	45522	2743033	62	8341·0	82160·6	41302	1220506
20	53602	1166326	44096	2697511	63	7734·6	74426·0	43938	1179204
21	51665	1114661	42809	2653415	64	7165·4	67260·6	46670	1135266
22	49792	1064869	41600	2610600	65	6656·3	60604·3	49721	1088596
23	47981	1016888	40464	2569006	66	6189·7	54414·6	52853	1038875
24	46232	970657	39809	2528542	67	5753·3	48661·3	55850	986022
25	44543	926113	38881	2488733	68	5338·0	43323·3	58523	930172
26	42912	883201	37796	2449852	69	4938·0	38385·3	59717	871649
27	41336	841865	36571	2412056	70	4540·1	33845·2	60931	811932
28	39814	802051	35342	2375485	71	4151·6	29693·6	61861	751001
29	38343	763708	33621	2340143	72	3777·2	25916·4	62273	689140
30	36916	726792	32296	2306522	73	3420·4	22496·0	62021	626867
31	35535	691257	31299	2274226	74	3082·6	19413·4	62958	564846
32	34201	657056	30562	2242927	75	2772·2	16641·2	61716	501888
33	32915	624141	29996	2212365	76	2482·8	14158·4	58871	440172
34	31675	592466	30115	2182369	77	2210·8	11947·6	54891	381301
35	30489	561977	29949	2152254	78	1954·4	9993·2	50172	326410
36	29348	532629	29637	2122305	79	1713·1	8280·1	43090	276238
37	28246	504383	29192	2092668	80	1477·4	6802·7	37298	233148
38	27178	477205	28704	2063476	81	1258·1	5544·6	32477	195850
39	26140	451065	27813	2034772	82	1061·0	4483·6	28354	163373
40	25120	425945	27223	2006959	83	841·10	3642·53	24720	135019
41	24123	401822	26904	1979736	84	737·73	2904·80	22136	110299
42	23154	378668	26781	1952832	85	617·73	2287·07	19442	88163
43	22213	356455	26852	1926051	86	516·05	1771·02	16657	68721
44	21301	335114	27681	1899199	87	426·52	1344·50	13840	52064
45	20429	314725	28178	1871518	88	346·27	998·23	11085	38224
46	19588	295137	28485	1843340	89	274·46	723·77	8735·5	27139
47	18771	276366	28646	1814855	90	213·42	510·35	6601·0	18403·4
48	17973	258393	28773	1786209	91	161·87	348·48	4724·3	11802·4
49	17191	241202	28708	1757436	92	118·89	229·586	3146·0	7078·1
50	16409	224793	28857	1728728	93	83·776	145·810	1896·0	3932·1
51	15637	209156	29225	1699871	94	56·018	89·792	1081·4	2036·1
52	14881	194275	29806	1670646	95	36·223	53·569	563·75	954·72
53	14147	180128	30606	1540840	96	22·757	30·812	259·84	391·15
54	13434	166694	32745	1510234	97	13·989	16·823	96·656	131·31
55	12770	153924	34284	1477489	98	8 4949	8·3278	17·500	34·656
56	12134	141790	35456	1443205	99	5·1562	3·1716	10·622	17·156
57	11511	130279	36438	1407749	100	3·1716	0·0000	6·5337	6·5337

Column D of the preceding Table has been formed from the expression $l_m\, v^m$, in which l_m represents the numbers living at the age m, according to the actual experience of the Order, and v^m represents the present value of £1 due at the end of m years at 3 per cent.: also,

D_m = quantity in col. D at any given age m; and
D_{m+x} = ... at any variable higher age $m + x$.

And in the same Table $N_m = \Sigma D_{m+1}$.

The columns D^s and N^s are formed on a similar principle:—

Let s_m = the amount of sickness annually to each person, aged m, expressed in weeks;
And $z_m = s_m\, v^{\frac{1}{2}}$
Then, as $D_m = l_m\, v^m$
$\therefore\ D^s_m = D_m\, z_m$
And $N^s_m = \Sigma D^s_m$

The following three Tables contain a condensed Abstract of the monetary values deduced from Table A U, which represents the experience of the Order in accordance with actual observation.

Table AV.

Value of an Annuity of £1 yearly, calculated from the actual experience of the Order.

Age.	Immediate Annuity for the whole of life.	Deferred Annuity to commence at age 70.	Temporary Annuity to continue till age 70.
	£ s. d.	£ s. d.	£ s. d.
20	21·7585 = 21 15 2	·6314 = 0 12 7½	21·1271 = 21 2 6½
30	19·6879 = 19 13 9	·9168 = 0 18 4	18·7711 = 18 15 5
32	19·2119 = 19 4 2¾	·9896 = 0 19 9½	18·2223 = 18 4 5½
40	16·9563 = 16 19 1½	1·3473 = 1 6 11½	15·6090 = 15 12 2¼
50	13·6993 = 13 13 11¾	2·0626 = 2 1 3	11·6367 = 11 12 8¾
60	10·3309 = 10 6 7½	3·5149 = 3 10 3½	6·8160 = 6 16 3¾
70	7·4547 = 7 9 1		
80	4·6045 = 4 12 1		

Table AW.

Premiums to Assure the sum of £1 Payable at Death, calculated from the actual experience of the Order.

Age.	Single Payment.	Yearly Payment to be payable during the whole of Life.	Yearly Payment to be payable up till Age 70.
	s. *d.*	*s.* *d.*	*s.* *d.*
20	·33713 = 6 9	·01481 = 0 3½	·01526 = 0 3¾
30	·39744 = 7 11¼	·01921 = 0 4¾	·02023 = 0 5
32	·41131 = 8 2¾	·02035 = 0 5	·02155 = 0 5¼
40	·47700 = 9 6½	·02657 = 0 6¼	·02904 = 0 7
50	·57186 = 11 5¼	·03890 = 0 9¼	·04627 = 0 11¼
60	·66997 = 13 4¾	·05913 = 1 2¼	·09122 = 1 10
70	·75374 = 15 1	·07082 = 1 5	
80	·83676 = 16 8¾	·14930 = 2 11¾	

Table AX.

Payments necessary to provide for an Allowance of £1 per Week during Sickness, calculated from the actual experience of the Order.

Age.	To provide a Sick Allowance up till Age 70.		To provide a Sick Allowance during the whole of Life.	
	Single Payment.	Annual Payment to continue till Age 70.	Single Payment.	Annual Payment to continue till Death.
	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*
20	35·1779 = 35 3 6½	1·59592 = 1 11 11	50·3246 = 50 6 6	2·21126 = 2 4 2¾
30	40·4865 = 40 9 8¾	2·06058 = 2 1 2½	62·4813 = 62 9 7½	3·02016 = 3 0 4¾
32	41·8408 = 41 16 9¾	2·19185 = 2 3 10	65·5843 = 65 11 8¼	3·24481 = 3 4 10¾
40	47·5718 = 47 11 5¼	2·89574 = 2 17 11	79·8969 = 79 17 11¼	4·44959 = 4 8 11¾
50	55·8715 = 25 17 5¼	4·52022 = 4 10 5	105·3538 = 105 7 1	7·16721 = 7 3 4¼
60	50·3825 = 50 7 7¾	6·85978 = 6 17 2¼	134·7038 = 134 14 1	11·88803 = 11 17 9¼

The formula for the construction of Tables AV and AW will be found in all the recently published works on Life Annuities, and the results given in Table AX may be easily determined from Table AU, as follows:—

$$\frac{N^s_m}{D_m} = \text{Results in column No. 4, Table AX.}$$

$$\frac{N^s_m}{N_{m-1}} = \text{Do. Do. No. 5, ...}$$

$$\frac{N^s_m - N^s_{m+n}}{D_m} = \text{Do. Do. No. 2, ...}$$

$$\frac{N^s_m - N^s_{m+n}}{N_{m-1} - N_{m+n-1}} = \text{Do. Do. No. 3, ...}$$

To avoid further argument on the subject, it will be assumed in the future pages of this paper that rates graduated to lower terms than set forth in the preceding Tables would be unsafe for the guidance of the Order. Complete evidence of this is furnished in the analysis of the facts and elementary data on which the calculations are founded; and the inherent evidence in the various parts of this paper amply demonstrate that the liabilities of the Order have been hitherto quite equal to those anticipated in these calculations. It therefore remains to determine whether the contributions exacted by the Order are such as are calculated to maintain the stability of the Institution, and realise the benefits promised to the members. It may be also as well to mention, that in the discussion of this point no statement will be advanced for which facts and examples both in and out of the Order do not exist. This is believed to be the only satisfactory mode of treating such a question. Unless ample data be available, it is impossible to measure the liabilities; but with sufficient data, it becomes a matter of certainty and of simple calculation, and the province of mere opinion is ceded to positive evidence, to which all must submit who can comprehend the argument.

It is not thought necessary to refer at this place to the rates and contributions hitherto demanded by the various lodges in the Unity, but to take up the question as to whether the scales drawn up by the Board of Directors at Manchester, and proposed some time since by the Glasgow A. M. C., are safe, and calculated to meet all the liabilities of the Order. Any arguments used in reference to those scales, whether in favour of their adoption or otherwise, will apply with greater or less force to the present rates of any particular lodge, according as they are greater or less than those of the proposed scale. This course is inevitable, as it is impossible to discuss the rules of each lodge *seriatim*.

In the Manchester Unity, during the year 1844, the total number of weeks' sickness experienced by the members was 226917, and the amount of money paid to sick members was £107,440 8*s*. 11*d*.: it hence follows that for each weeks' sickness there was paid about 9*s*. 6*d*. As a standard of comparison it may therefore be assumed that the general practice of the Unity is to pay 10*s*. per week in sickness, and we shall test the accuracy of the proposed scales on this ratio. Some lodges no doubt pay more, and others less, to their members, than the above average: but if the terms are calculated for 10*s*. per week, it will then be easy to determine the rate for any other particular scale of payment.

In the first instance reference will be made to scale No. 1, or manufacturing class, as prepared by the Board of Directors, and recommended to be adopted. The average age of the members of the Unity was stated to be then 32 years; and making that the point of comparison, it will be found that a weekly payment of 5*d*. by the members is to provide for them the following benefits, viz.:

£0	10	0	per week during sickness,
£10	0	0	at the death of a member, and
£5	0	0	at the death of a member's wife.

But it will also be found that in addition to the 5*d.* per week, each member has paid entrance money, which for age 32 is equivalent to an annual payment of 1*s.* 1*d.* A payment of 5*d.* weekly is equal to a yearly sum of £1 1*s.* 8*d.*; and to this add 1*s.* 1*d.*, and the full yearly payment will be £1 2*s.* 9*d.*

Let us next determine how far this payment is calculated to meet the liabilities of the Order, according to the data already alluded to.

	£	*s.*	*d.*
On reference to Table A S, it will be found that the annual payment at age 32 for an allowance of 10*s.* per week during sickness, to continue to the extreme of life, is	1	14	4½
For £10 at death of a member, age 32, Table A M . . .	0	3	8½
To provide £5 at the death of a member's wife, (the deaths being in the ratio of 1650 to 2286 of the members themselves—see Table A Y), the payment will be	0	1	4
Total payment required for the three benefits promised by the Order	£1	19	5

The payment necessary to provide for the benefits promised will thus be seen to amount to £1 19*s.* 5*d.* to each member yearly, but the actual sum demanded according to the new scale, No. 1, is only £1 2*s.* 9*d.*, being about 42 per cent. less than the terms necessary to enable the Unity to meet its engagement. It should be kept in view that in the preceding calculation nothing is allowed for expenses of management, so that the sum of £1 19*s.* 5*d.* is absolutely necessary to meet the various liabilities without any deductions whatever.

Again: according to Table A U preceding, constructed on the actual experience of the Order, the following are the rates necessary to provide the same benefits, viz.:—

		£	*s.*	*d.*
Yearly payment required at age 32, on account of an allowance of 10*s.* per week during sickness, to continue to the extreme of life, is, according to Table A X, preceding	=	£1	12	5½
For £10 at death of a member at age 32, Table A W . .	=	0	4	1
To provide £5 at the death of a member's wife (the deaths being in the ratio of 1650 to 2286 of members themselves—see Table A Y)	=	0	1	5½
Total payment required for the three benefits promised by the Order, and according to the data derived from the experience of the Unity	=	£1	18	0

This result is of vital importance, and should receive the immediate and earnest attention of the members. It is believed that the form in which the present evidence is

given, will enable any one of ordinary intelligence to test all the figures, and thoroughly satisfy his own mind of the perilous condition in which the Order is at present placed.

From a succeeding Table, A Y, it will be seen that the annual income of the Order, under the head of contributions, is £245,842 13*s.* 8*d.*, and, according to the preceding figures, there would still be an annual deficiency of no less than £209,688 11*s.* 10*d.* The awful calamity which must await the Order under such circumstances cannot fail to alarm the members as to the terrible consequences which must inevitably follow their neglect or indifference in carrying out the radical reforms necessary in their constitution. Truly, in such an event, the sins of the fathers will be visited on the third and fourth generations. A quarter of a million of men have now the opportunity of perpetuating one of the most useful institutions ever developed by the working classes of any country. Under proper regulations, it may be the direct means of elevating the moral and physical condition of a vast body of the rising generation, and imparting a social character and importance to the industrious and provident classes which they have never yet acquired; but, to participate in those advantages, it is absolutely necessary that a great movement should be made towards financial reform in the institution. Let, therefore, every member say to himself, "I will put my shoulder to the wheel,—I will make an effort, which I am certain is quite within my power,—I will do that, as an individual, which others have done in smaller institutions, and which is only just and equitable,—I will listen to the warning which science and experience set before me, and I shall then have the satisfaction of believing that I have done the best that could be done; I shall feel convinced, that with good and economical management, our institution will survive and prosper,—it will really and truly be the support of my declining years; when the infirmities of old age creep upon me, I shall have the consolation of falling back on the industrious savings of vigorous youth. My family will be induced to follow my example. With my friends and neighbours all petty jealousies will be set aside,—we shall unite in promoting our own and our children's welfare; and while we profess to unite in the bonds of true fellowship, let us honestly exclaim—

> "Two are better than one;
> If they fall, the one will lift up his fellow;
> But woe to him that is alone when he falleth,
> For he hath not another to help him up."

Again: as it has been shewn that the proposed scale, No. 1, would occasion an annual deficiency in the income of £209,688 11*s.* 10*d.*, the following figures will point out what amount of contribution would be required at the present moment to make up that deficiency.

The present value of an annuity on a life of 32 is 19·98129 (see Table A H), or nearly 20 years' purchase; so that if the contributions were to continue on the scale now proposed,

each member would need to pay down at present the sum of £16 9*s.* 8*d.* (16·984), to make up future deficiencies in his annual payments.

But as there were 251727 members in the Unity in January 1845, these two items multiplied together will produce the sum of £4,275,181. From this subtract £700,000, the capital stock of the Order at the same period, and £3,575,181 will be the payment that should be made in order to place Odd Fellows on a secure foundation, with their proposed scale of contributions.

The members, however, must keep in view that should no such donation be now made to the society, then the ultimate deficiency under their proposed rates will be much more than £3,575,181; for in order to enable that sum to meet all the demands on the society it should be invested to yield 3 per cent. compound interest. As there is no chance, however, of any such donation, the ultimate deficiency will be about ten millions.

But there is another, and perhaps a simpler mode by which members may satisfy themselves of the inadequacy of the proposed scales. On referring to Table V, page 409 of this Contribution, it will be found that at age 32, which is the average age of members in the Unity, the amount of sickness per annum to each is ·9250 weeks, or 6 days 11 hours to each member; and as, over the whole Unity, the payment for a week's sickness is 9*s.* 6*d.*, that will average to each member yearly 8*s.* 9½*d.*, but by Table V it will be seen that the actual expenditure on sickness during 1844, was 8*s.* 10¼*d.* to each member. We have, therefore, so far a most satisfactory confirmation that the data of these Contributions is applicable to the Order; and carrying out the reasonings on the same basis, it will follow that at the present time there should be an annual saving on the income of each member's contributions for sickness alone of £1 5*s.* 1*d.*; but the actual saving on this item was only about 11*s.* 4*d.*, and on the total income of all the Lodges there was a saving to each member during the same year of about 26 per cent. only; while under a proper graduation of the contributions, the saving would have been at least 75 per cent., or three times the actual amount. To this it may be replied, that the illustration may faithfully represent the former condition of the Unity, but it is not applicable to the new scale. An inspection, however, of Table A Y will shew that during the year 1844, the receipts from each member over the whole Unity, in the shape of contributions, was about £1 0*s.* 2½*d.*, while the amount proposed to be levied under scale No. 1, is £1 1*s.* 8*d.* for 10*s.* weekly during sickness, and the collateral benefits; but as the average sick allowance in 1844 was only 9*s.* 6*d.* per week, the corresponding contribution for the full benefits of scale No. 1, would be £1 1*s.* 3*d.* yearly, differing only by 5*d.* from the terms of the proposed scale. It is, consequently, evident that the preceding arguments, drawn from the past experience of the Order, are equally applicable to the proposed scale of payments.

It will thus be seen that the proposed scale No. 1, instead of demanding an increased rate of contributions from the members, is just leaving them in the same position in which they were placed during 1844. The effect of that scale is not to increase the income of

the Order, but to produce an uniformity between the income and expenditure of the various lodges. From the violent opposition offered to its adoption, the innumerable dissensions and bickerings, and the many angry discussions to which the proposal has given birth, there can be no doubt that the popular belief is, that the tendency of the proposed scale is to increase the payments by members. It is also evident that the intention of the Glasgow A. M. C. and the Board of Directors at Manchester, was to augment the amount of the contributions; and that they have not done so, can only have arisen from their own ignorance of what was the condition of the various lodges at the period referred to. The following analysis of the money condition of the Order during 1844 will, however, set the question at rest, and enable any one to prove the above facts for himself. It may also be stated that the classification adopted is identical with that set forth in Table A Z, page 506 of this Contribution.

Table A Y.

Income and Expenditure of the Manchester Unity during the Year 1844.

Districts.	Number of Members, Jan. 1, 1844.	Average No. of Members during 1845.	Income from									Expenditure on								
			Contributions.			Initiations.			Fines, Goods, &c.			Sickness.			Funerals, &c.			Sundries.		
			£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*
Rural .	68553	66208	62072	5	0	10544	19	2	7875	2	3	26849	3	4	14697	6	2	16303	1	6
Town .	79790	77070	74959	4	11	14295	18	10	9429	1	0	32617	3	8	19342	10	11	21637	1	8
City. .	103384	99848	108811	3	9	24541	11	1	12671	5	1	47974	1	11	28702	14	5	33480	13	2
Whole Unity	251727	243126	245842	13	8	49382	9	1	29975	8	4	107440	8	11	62742	11	6	71420	16	4

The above Table furnishes the details of Income and Expenditure for the Rural, Town, and City Districts separately; but the remarks will, in the first place, be confined to the results for the whole Unity.

The following is the Income and Expenditure for the whole Order during the year 1844:—

Income.	£	*s.*	*d.*
From Contributions	245,842	13	8
... Initiations, or Entry Money	49,382	9	1
... Fines, Goods, and Sundries	29,975	8	4
Total Income during 1844	£325,200	11	1

Expenditure.	£	*s.*	*d.*
Paid to Sick Members	107,440	8	11
... For Funerals, District and Widow and Orphan's Fund .	62,742	11	6
... For Sundries	71,420	16	4
Total Expenditure during 1844	£241,603	16	9
Surplus of Income over Expenditure for the year 1844 .	£83,596	14	4

Or an annual saving to each member of about 6*s.* 10½*d.*

The following will give an idea of the expenses of management of the Order :—

Ratio of Expenses of Management to the whole Expenditure	29 per cent.
... to the amount paid to Sick Members	66 ...
... to the amount paid for Funerals	113 ...
... to the Income from Contributions	29 ...
... to the Total Income	22 ...

It is evident that if such an application of the funds be permitted to continue, the dissolution of the Order must be fast approaching. The Directors of the Unity are therefore most imperatively called on to interpose their influence to prevent such a lavish expenditure on the part of the lodges. It will be seen that it is not to one year alone that this enormous outlay is confined, but must have been peculiar to the whole history of the Order. In 1834 the number of members was about 60,000, and at the beginning of the present year the number was 251,727—increase about 19,000 per annum; but in connection with this, a remarkable fact deserving of serious consideration is brought to light by the Directors. They state that "the amount of initiation-money which was received from members in 1844, being no less a sum than £49,382, it will be discovered, on reference to the list of lodges, that our increase of members in that year was only 21,461, and by these returns it is clearly proved that upwards of 40,000 members were initiated in 1844; thereby at once affirming that upwards of 20,000 members left the Order in one year, after paying their initiation-money and contributions for a length of time. We are of opinion that the particular attention of the members of the Order should be drawn to this important fact, with a view of arriving at the true cause why so many leave the Order." At this rate the total amount of initiation-money received by the Order ought in January 1845 to have realised a capital of £750,000 at least, without any augmentations from other contributions; but it is understood that the whole capital at that time did not exceed £700,000: so that the Unity now finds itself in this position, that they have been proceeding on a plan, by which the contributions are not sufficient to meet the current expenditure, and that they have been actually falling back on the initiation-money of the members. Further argument is not needed to shew the insecurity of any institution when based on such a system. And it ought to be kept in view that

this state of things prevails when the bulk of the members must be very young, and are represented at an average age of 32—a period of life at which the rate of sickness is not equal to one week per annum to each person. Where then is the boasted provision so loudly proclaimed by some to meet the vicissitudes and infirmities of after life, when the rate of sickness per annum will be from 10 to 20 weeks to each member? It is astonishing that people can be so blind to their own interest, and not see the awful calamity which awaits them unless decided improvements are effected in the condition of the Order. In Manchester, the fountain-head of the Unity, the greatest possible opposition has been given to the recent changes suggested by the A. M. C., and carried out by the G. M. and Board of Directors. The most angry and violent manifestation of feeling has evinced itself, threatening dangerous and fearful consequences to the whole Order; and yet in the same district, palpable and obvious examples are to be found of its utter inability to survive long under such a deplorable condition.

In Manchester itself there are 6 lodges established on an average of 11 years; and on the 1st of January 1845, they contained 530 members, and were possessed of funds—to what amount will it be believed possible?—why the lamentably small sum of £91 13*s.* 6*d.*, or less than one-twelfth of the entrance money which must have been paid into the lodges. Again: there are 12 other lodges, established for an average period of 4¼ years, and containing 613 members and their total amount of funds is £313 15*s.* only. And further: of 33 lodges which have been open for an average period of twelve years, but recently suspended, and which contain 2,774 members, the gross amount of funds they possessed on the 1st of January, 1845, was only £1,379 6*s.* 6*d.*, or not one-half of the initiation-money paid into the lodges. Yet, with such striking and obvious signs of decay, the Board of Directors are forced to contend against the most ill-conceived opposition. No one with his eyes open can fail to see that the Unity has arrived at that period of its history when its income must of necessity be unable to meet the required expenditure. Out of 100 lodges, containing 11,080 members, the whole of their accumulated capital did not amount to 13*s.* per member.

It really seems surprising that any evidence beyond this should be wanting to bring conviction to the minds of Odd Fellows, of the urgent need of immediate reform. In some lodges the expense of management absolutely exceeds the amount paid for sick allowance; and in many instances amounts to a sum varying from 8*s.* to 13*s.* yearly, to each member; while in others more than half the original contributions are squandered away in the modes of management adopted; and in one district, among 2800 members, the expense of management during the year was about £1100. Nothing could stand this long, even though the rates and contributions were otherwise well graduated. Take the following as an example of the reckless expenditure indulged in by some lodges. That it may not be thought an isolated instance, but of serious and fearful importance, it is only right to mention that the following figures shew the income and expenditure of 14

different districts, containing 297 lodges and 17,059 members, and therefore to be considered by all well-wishers of the Order as demanding immediate redress.

Income.	£	*s.*	*d.*
Amount of Contributions received	21,402	15	7
Amount of Initiations	12,436	16	7
Amount of Fines, Goods, Sundries	3,712	4	9
Total Income during 1844	£37,550	15	11

Expenditure.	£	*s.*	*d.*
Amount paid to Sick Members	6,998	18	3
... for Funerals, Districts, and Widow and Orphan Funds	7,566	2	4
... for Sundries	10,497	12	9
Total Expenditure for 1844	£25,062	13	6
Surplus of Income over Expenditure for the year 1844	£12,488	2	7

This, perhaps, contains facts of the most extraordinary kind ever yet brought before the public. Many, even among the Odd Fellows themselves, do not see the great moral and social revolution which the existence of such provident institutions is capable of effecting; but so long as a system of destructive and hurtful management prevails, no national or public blessing can flow from them. But reform the abuses—let the working man understand under what a delusive shadow he has placed his hopes—let him see the dangerous gulf into which all the funds of the Order are being carried, and then reflect what must be its fate twenty years hence, should such an awful exhibition of facts be continued—and there is no doubt he will soon perceive that his interests can only be promoted by a speedy removal of the fatal abuses.

The following is the state of the case in the 14 districts just referred to, which contains 297 lodges, and 17,059 members:—

Ratio of Initiation Money to Contribution	58	per cent.
... Expenses of Management to ditto	49	...
... ... Management to Amount paid for Funerals	138	...
... ... Management to Amount paid for Sick Allowance	150	...

Expenses of management actually 150 per cent. of that paid away to sick members! To relieve and give assistance to members during sickness ought to be, and is, the ostensible object of the institution; but here we have an example of that great virtue of charity and social refinement being sacrificed to the idle indulgence and intemperate appetites of a few

men who, when the cause of the sick and the distressed, the widow and the orphan is pleaded, are ready to rise in noisy turbulence to crush the well-intentioned endeavours of those who attempt to sweep away such intolerable abuses.

The recent opposition to the Board of Directors is most reprehensible, and no well-directed mind can look upon it otherwise than with the deepest regret. There never has existed any social and provident institution of anything like the importance of the Manchester Unity of Odd Fellows; neither, perhaps, did such gross abuses ever exist in any other. The real and essential objects of the Order have been overlooked, and rendered secondary to idle pomp and parade; and those funds which were meant to provide for disease and old age have been squandered on the follies and baubles of youth.

Now, however, that the Board of Directors have made a step in the right direction, let them be supported warmly and cordially. This done, a second and greater reformation must soon follow, which will place the Unity on a permanent foundation, and render it the most gigantic and useful institution of the day. Few, at the present time, understand the wonderful operation going on in the social state towards its own regeneration. Poor-laws and other nostrums seem as much to irritate as allay the disease; but here we have a self-supporting body which, although hitherto managed with a total disregard to science and practical experience, yet contain so much of benevolence, love, and social order, that no less than 40,000 yearly of the hard-working sons of toil embrace its genial comforts and solacing charms. What, then, must be its influence, if only guided by the light of reason, science, and experience, when confidence has inspired the nation in the judgment of its laws, and the integrity and practicability of its principles? There is little doubt that thousands for hundreds would join its ranks; and that the national protection against vice and its horrors, which political laws have failed to secure, would be wrought out by the social improvement among the working classes themselves. But to make such an institution permanent and secure, its means must be commensurate with the end in view; its monetary calculations must be correct, and in conformity with those laws of sickness and mortality which are known to influence its whole transactions.

The following is a still further analysis of the Income and Expenditure of the Order during 1844; and an inspection of the fourth column will shew that the average income from each member, in the shape of contribution, was £1 0*s.* 2½*d.*, as stated in a preceding part of this Contribution, while the total income from each member, from all sources, as set forth in the sixth column, was £1 6*s.* 9¼*d.* It may be stated that those items are not calculated on the maximum number of members for that year, but on the mean number as given in Tables Y and A Y. Many useful applications may be made of this Table, but here it is only necessary to refer to a few of the items.

From a consideration of the following facts and figures it is abundantly evident, that so far as the whole Unity is concerned, the proposed scale, No. I, would not be safe; and the next question which arises is, the propriety of scale No. II, as prepared by the G. M.

Table A Z.

Shewing the Proportion of Income and Expenditure in the Manchester Unity for each District, and to each Person, during 1844.

Districts.	Ratio of Expenditure on Sickness to Contributions.	Ratio of Expenditure on Sickness and Funerals to Contributions.	Ratio of Total Expenditure to Total Income.	Income from each Member by Contributions.	Total Income from each Member.	Expenditure on Sickness to each Member.	Total Expenditure to each Member.
	Per cent.	Per cent.	Per cent.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Rural .	43·254	66·932	71·870	0 18 9	1 4 $3\frac{3}{4}$	0 8 $1\frac{1}{4}$	0 17 6
Town .	43·513	69·316	74·578	0 19 $5\frac{1}{4}$	1 5 $7\frac{1}{4}$	0 8 $5\frac{3}{4}$	0 19 $1\frac{1}{4}$
City . .	44·089	70·466	75·438	1 1 $9\frac{1}{2}$	1 9 3	0 9 $7\frac{1}{4}$	1 2 $0\frac{3}{4}$
Whole Unity	43·702	69·224	74·293	1 0 $2\frac{1}{2}$	1 6 $9\frac{1}{4}$	0 8 $10\frac{1}{4}$	0 19 $10\frac{3}{4}$

and Board of Directors, being adopted by the agricultural classes. The relation which scale No. II bears to scale No. I is that of 4*d.* to 5*d.*; or in other words, the same benefits for which the manufacturing classes are required to pay 5*d.* per week, the agricultural classes are required to pay only 4*d.* per week, or 20 per cent. less. Let us, therefore, examine whether there be sufficient reason for adopting two scales of contributions, and making the above distinction between the manufacturing or Town Districts, and the agricultural or Rural Districts.

On turning to Tables V and Y, it will be found that they represent the relative amount of sickness in the various districts according to the experience of friendly societies, and also according to the experience of the Unity itself; and as both classes of results agree so nearly, the monetary expressions deduced from the one may be held to represent the other.

The regulations of the Unity imply that allowances will be given in sickness, or during incapacity for labour, till the extreme of life, but the monetary Tables for the various districts provide for sickness to 70 years of age only. It will, however, be found that a deferred annuity, after that term of life, of half the amount, combined with the other, will be nearly equivalent to an allowance in sickness during the whole term of life. And the following illustration will shew their relative values. In Table A S, page 480, it will be found that, at the age of 30, the annual premium, for an allowance of £1 per week in sickness, during the whole period of life, is about £3 7*s.* 6*d.* Now, the annual premium for the same allowance up to age 70 is about £2 1*s.*, and the annual premium for a deferred annuity of 10*s.* per week after the age of 70 (Table A I, page 471), is £1 9*s.* 4*d.*; total annual premium for both, £3 10*s.* 4*d.* The difference between this sum and the preceding is, therefore, not so much as materially to affect the comparison.

Let us see, then, what annual payment would be required, in each district, for the following benefits, viz.:—10*s.* per week in sickness till the age of 70; £10 at the death of a member; a deferred annuity of 5*s.* per week at the age of 70; and £5 at the death of a member's wife,—which are equivalent to the benefits proposed in scale No. 1, or manufacturing class. The following shews the yearly payment which should be charged at the age of 30, for each of those benefits in the three districts, as well as in the three districts combined, which last group may be considered to represent the whole Unity:—

Description of Benefit.	Rural Districts*.	Town Districts*.	City Districts*.	The Three Districts combined.
	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*
10*s.* per Week during Sickness . .	0 19 2	1 3 2	1 1 3	1 0 6
Deferred Annuity of 5*s.* per Week .	0 16 7	0 11 0	0 10 10	0 14 8
£10 at the Death of a Member . .	0 3 5	0 3 11	0 4 4	0 3 8
£5 at Death of Member's Wife . .	0 1 3	0 1 7	0 1 6	0 1 4
The above four combined . .	2 0 5	1 19 8	1 17 11	2 0 2

The figures in the above Abstract may be regarded as an approximation to the relative liabilities of the lodges in the various districts as near as our present knowledge will admit of arriving; and it is somewhat curious to observe, that those places or districts usually thought most hazardous are actually least so. There is no doubt that the members of the Glasgow A. M. C., in resolving to adopt two scales of contributions, were impressed with the belief that the lodges in the Town and City Districts were subject to greater liabilities than those in the Rural or Agricultural Districts, but the facts of the case will be seen to be otherwise. The error has, in all probability, arisen from supposing that the risks of the various districts would bear the same relation to each other as the rates of mortality among the members of those districts. In fact, the propriety of having two scales has been generally argued on that shewing; and under a cursory survey of the question, the one opinion was, perhaps, a natural enough sequence of the other; but a more comprehensive view of the subject will shew that the legitimate effect of increased mortality is to diminish the liabilities of the lodges, instead of increasing them as has been supposed.

It will be seen by an inspection of the figures in the preceding Abstract that the risk incurred from sickness, greatly exceeds that from the mortality of the members.

* For the Rates applicable to the Rural, Town, and City Districts respectively, see pp. 471, 474, and 479.

Expressed in money, the relative values of those two items for each member entering a lodge at the age of 30, are—

For 10*s.* per week in sickness	£34 7 4
For £10 at death	3 14 10

the one being more than nine times that of the other. It has been equally well established, that increased mortality is not always accompanied with an increased rate of sickness; and the direct consequence of these two facts is to render the liabilities of lodges in what are usually called the healthy districts, actually greater in some cases than in the less favoured districts. For an illustration compare the Rural Districts in the preceding Abstract with the City District. The apparent anomaly may be explained in this way:—If 100 members, at the age of 30, were to enter a lodge in a Rural District, and at the same time 100 members of the like age were to enter another lodge in a City District, the result would be, that 40 years hence, when the surviving members had attained 70 years of age, in the Rural Districts 52 of the original 100 members would still be alive, while in the City District 38 only would reach that period of life. Well then, to carry out this illustration, suppose the plan of those lodges to have been to demand a single payment from the members on entering, to provide 10*s.* per week in sickness up till the age of 70, the 100 members on entering the lodge in the Rural District would have had to pay down £1986, but the members in the City District would have been required to pay £2041—exceeding the other district by only £55, and at the end of 40 years the funds of both lodges would be exhausted. Next, let us suppose that the foundation of those lodges was on the general plan of the lodges in the Order, in which a sick allowance is guaranteed till the extreme of life; then their relative liabilities will appear in a new light. The lodge in the Rural District has become saddled with 52 members, while in the City District there are only 38 members; and without further evidence it will be obvious that the lodge in the Rural District is placed under the greatest liabilities. During the succeeding ten years, each member in the Rural District would experience about 21 weeks' sickness yearly, and as there are 52 members, the aggregate sickness would be 1092 weeks yearly. On the other hand, each member in the City District would experience 24 weeks' sickness yearly; but as the number of members is only 38, the aggregate sickness would amount to 912 weeks per annum, falling short of the amount of sickness experienced by the lodge in the Rural District by no less than 180 weeks yearly. It will thus be seen, that the very fact of the increased longevity of the members of the Rural Districts, chiefly accounts for the increased liabilities of the lodges in those districts. The advanced period of life is that in which the great amount of sickness is experienced, and in the City Districts the members are cut off before attaining it; but the prolongation of life in the Rural Districts places on the sick list of a lodge a great mass of members at an advanced age, when they become also permanent burdens on the funds.

The relative liabilities, so far as sickness is concerned, in the two districts, may be represented by the following money expressions, which are the equivalents in a single payment, for members entering at the same age, to provide equal allowances in sickness during the whole period of life:—

Rural Districts	£36	19	5
City Districts	30	15	8

So far, then, it is obvious that the scales No. 1 and No. 2, published by the Board of Directors, are not at all applicable to the classes for which they were intended; for if the facts of the case were admitted to have any weight, they would go to reverse the application of those scales, and that which was meant for the Town or Manufacturing Districts and Classes, would be applied with more truth to the Agricultural Districts and Classes.

On referring to the preceding Abstract, it will be seen that the annual payments for the four benefits combined, amount, in the—

Rural Districts to	£2	0	5
Town Districts	1	19	8
City Districts	1	17	11

So that if those benefits were adopted by the Unity generally, or any other scale of benefits bearing the same relation, the contributions in the Rural Districts, if adjusted on equitable principles, should be the highest, and those in the large City Districts the lowest, the smaller Town Districts being intermediate. It becomes, however, a practical question of important consideration, whether our knowledge of the subject has yet become so refined, and whether the difference in the risks of the various classes has been proved to be so remarkable, as to render two scales of contribution necessary.

If the results for the three districts combined, as given in the preceding Table, be viewed in connection with those for each of the districts, it will immediately appear that the difference, although of the opposite character to that anticipated, is, after all, exceedingly small, and, in a practical sense, unimportant; as there is scarcely another feature in the management of the various lodges, which has not more influence on their monetary affairs. For the City Districts, the difference is 2*s.* 3*d.* yearly; for the Town Districts, the difference is 6*d.* yearly; and for the Rural Districts, the difference is 3*d.* yearly.

To recognise, therefore, a difference in various districts, while lodges are, as in the Unity, all under the same general constitution, is clearly a refinement at which the most improved institutions of the day have not yet arrived.

An inspection of the same Abstract will further prove, that if the regulations of the lodges in the Unity were such as to give a member the option of providing any one or more of the four benefits, the case would be immediately altered, and it would become, in that event, necessary to make a distinction in the payments. There is no doubt that even

this change, with many others of an important nature, will take place before many years pass away, and render the Order the great asylum of the working and industrious classes, to which they can, with confidence, resort for relief from the pecuniary distress and indigence which almost invariably attend sickness and disease.

It will not now be necessary to enter into the question of the influence of employment or occupation on the liabilities arising from the various classes of members, as it is evident that the increased mortality and sickness in peculiar trades place them relatively to the Unity in a similar position with that which the members of the City Districts were shewn to hold to those of the Rural Districts; and, therefore, the same arguments used in respect to the influence of locality on the liabilities of lodges, are equally applicable to the question of employment.

The preceding results, drawn from direct observation and calculation, shew that there is, in fact, no reason to make any distinction between the manufacturing and agricultural classes in the Unity; and hence, since it has been shewn that scale No. 1 is unsafe, and must bring ruin on the institution, the danger to be apprehended under scale No. 2 is still greater. There remains, however, another way by which to shew to members the remarkable uniformity which prevails among those results for various classes of the community, and the precision with which their various liabilities may be determined under a proper analysis of the subject; and for this purpose reference is made to Table A Z.

An inspection of the first column of that Table will shew, that in the various districts the expenditure on sickness bears a very striking and uniform relation to the amount of contributions; and, therefore, some very powerful influence must prevail, or so positive a determination of the results could not be produced. In the whole Unity, the expenditure on sickness is 43·702 per cent. of the income from contributions, and in none of the districts is the difference in this item so great as one-half per cent., or 1-87th of the whole. So uniform a result is well calculated to inspire confidence in those laws of sickness which represent the liabilities of benefit societies of every description. Again, in all the other columns of the same Table, a similar harmony will be found to prevail; but, as items of a fluctuating character enter into those columns, the results are somewhat disturbed, although not to any important degree. It will be seen that the relation of column 7th to 5th is expressed by the figures in column 2nd. It will likewise be seen, that the income from each member is least of all in the Rural Districts, somewhat higher in the Town Districts, and greatest of all in the City Districts; but then it will be further seen that the expenditure on sickness in each of these districts bears almost precisely the same relation to the respective incomes of those districts. An inspection of column 4th will, however, shew that in the Rural Districts, although the expenditure on sickness is in the same proportion as the other districts, still the ratio of the total expenditure to the total income is less than in the other districts; this, no doubt, arises from a difference in the mode of management, and admits of ready explanation.

The following will shew the total surplus or saving to each member of the Unity, for each of the Districts, during the year 1844:—

	Rural District.	Town District.	City District.	The Three Districts combined.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Actual Saving to each Member . .	0 6 9¾	0 6 6	0 7 2¼	0 6 10½
Saving per Cent. on the Income for each Member	27 per cent.	26 per cent.	25 per cent.	26 per cent.

It will thus be seen that there does exist some general principle or law by which the relation of expenditure to income is regulated in the Order. A remarkable uniformity was shewn to prevail in the ratio of expenditure on sickness to the income from contributions; the result in none of the districts differing by one-half per cent. from that for the whole Unity, so also will the relation of the total expenditure to the total income in the various districts be found to differ but little.

It is, therefore, obvious that, so far as the experience of the Unity goes, there is no reason to believe that the lodges in the Rural Districts are in a more favourable condition than those in the larger Towns and Manufacturing Districts. It is equally clear, from the facts and principles adduced elsewhere, that on the scheme on which the lodges of the Order are conducted, there is no reason for having two scales of contributions; and that, before such innovations are introduced, other important changes, of a character not yet recognised in the Order, must take precedence. It consequently follows that all the objections brought against the adoption of Scale No. 1, come with redoubled force against the introduction of scale No. 2. The recent appeal made by the Board in favour of the general adoption of scale No. 1 is, therefore, to be strongly approved of; and it is hoped that a strenuous effort will be made to induce the lodges to relinquish both scales, and determine on one better calculated to carry out successfully the high and beneficial purposes of the Order. The means of obtaining competent opinions on such subjects are ample; and it should be the imperative duty of every member, but particularly of every officer of a lodge, and in an especial degree of every one of the directors, to institute a searching inquiry, and settle a question, the importance of which cannot be doubted, and the angry and unprofitable discussion of which now threatens so much danger to the Order.

One remarkable feature connected with the history of Odd Fellowship, is that of exacting a uniform rate of contribution from all members from 18 to 40 years of age. Almost every other friendly society of any pretensions has long relinquished any such plan. When the laws of sickness and mortality were but imperfectly understood, it was natural enough to expect no distinction to be made for difference of age; but those days have

passed away, and no scientific fact is now better established than the influence of age on the amount of sickness and mortality. It is, therefore, surprising that an institution of the gigantic proportions of the Manchester Unity, should have remained to the present time, either quite ignorant of such a principle, or indifferent to its importance.

By consulting Tables V and X, the influence of age on the amount of sickness will become evident. In the decennial period of life from 20–30, the amount of sickness to each member is under 9 weeks, but in the period from 60–70 years of age the sickness equals above 77 weeks, and in the intermediate periods of life, like differences prevail. The injustice of admitting members at those extreme ages on equal terms is therefore obvious, but even within the ages recognised for admission by the Order striking differences will appear.

The results in the following Abstract are derived from the respective Tables in this Contribution.

Yearly Payments required.	Age 20.	Age 30.	Age 40.
	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*
To secure 10*s.* per week in Sickness for whole life (see Table A R) . . .	1 3 6	1 12 0	2 6 9
To provide £10 on the Death of a Member (see Table A M)	0 2 9	0 3 6	0 4 9
For £5 at Death of Member's Wife (see explanation, page 498)	0 1 0	0 1 3	0 1 8
Total payment for the above Three Benefits	1 7 3	1 16 9	2 13 2

From the above Abstract it will be seen that the payments necessary to provide for the above benefits at age 40, are nearly double those required at age 20; nothing could therefore be more absurd than to admit members entering at those ages on the same terms: and yet this is, in effect, done by the Order. It is true, that according to the 32nd General Law, members entering at ages under 35 pay entrance or initiation money of £1 1*s.*, but those entering at age 43 pay £5 5*s.* Let us, therefore, determine to what extent those sums will affect the yearly contributions. On going back to Table AH it will be found that those entrance moneys are, at age 20, equivalent to an annual payment of—

	£0	0*s.*	11*d.*
at age 30	0	1	0
at age 40	0	6	0

Hence it will follow that the yearly payments by those entering at the given ages should be augmented by the above sums, which are equivalent to the initiation fees paid to them; and the following will shew the yearly sums thus actually paid by the various classes of members according to the proposed scale, and the sums which ought to be paid.

Age at Entry.	Actually Paid.	Ought to be Paid.	Deficit.
	£ s. d.	£ s. d.	£ s. d.
Members entering at Age 20 . .	1 2 7	1 7 3	0 4 8
Ditto ditto 30 . .	1 2 8	1 16 9	0 14 1
Ditto ditto 40 . .	1 7 8	2 13 2	1 5 6

The danger as well as the injustice of following such a practice must be obvious to the most casual observer. By young members joining the Order at age 20, there is an annual loss of 4*s.* 8*d.*; but by those entering at age 30, the yearly loss is increased to 14*s.* 1*d.*; and by those members entering about age 40, the loss per annum is as much as £1 5*s.* 6*d.*; so that in fact this last class of members pay little more than half the yearly sum necessary to meet the liabilities incurred by the lodges through their membership. The injustice thus done to those who enter at an early period of life, and the perilous position in which the whole Order must be placed by the admission of members of 30 years of age and upwards on the same terms, should call for immediate reform. The abuses of Odd Fellowship are of the most serious and alarming nature; and if not at once struck at the root and eradicated, they will soon become too formidable to admit of the possibility of applying any remedy.

Many attempts have lately been made to meet such arguments and facts as the preceding, by bringing forward the experience of particular lodges; but a very few observations will readily shew the impropriety of such a course. The experience of the Providence Lodge, Manchester, for the period of 13 years, has just been published, from which it appears that the sickness of each member varies in some years from 6 hours per annum to 10 days 2 hours, and the average for the whole period is 4 days and 6 hours to each member; but when it is stated that those fluctuating results are deduced from a society in which the number of members varied in the same period from 24 to 82, no surprise will be felt at such irregular results. To argue any principle or rule for the guidance of lodges in general, from so limited and meagre a body of evidence, would be as futile as to measure the value of life in the whole community from the results of mortality in an individual family. Many other instances can be furnished, illustrative of the wide discrepancies resulting from small numbers. For example, taking 8 different lodges, of ready reference from the October Quarterly Report of the Manchester Unity, in which there are in all 265 members, it is found that the average sickness to each, during the year 1844, was only 2 days and 13 hours; but taking 8 other lodges with 294 members, the average sickness was no less than 10 days and 18 hours. Such results are not at all extraordinary or unexpected. To the most limited observer it is well known that it is only an essential feature of the law of sickness. With small numbers no guarantee can be given for particular results; but as the number of persons over which the observations extend are increased, then a nearer approximation to the defined law will manifest itself. On

referring to a report of an interesting nature, although defective in some of its details, recently issued by the Blackburn Districts, it will be found that during the five years, 1841–1845, the number of members varied from 1510 to 2154; or more correctly, the average number of members exposed to the risk of sickness during that time was 1654, and the total amount of sickness was 7109 weeks, or 6 days and 3 hours to each member yearly. If disparity of age, and some other features connected with this report, were taken into account, a near approximation would be found to the rate of sickness as developed in the early part of this paper; but if the numbers observed were extended still further, and formed into large groups, such as those given in Table Y, then the results would produce a complete verification of the law of sickness.

These observations naturally lead to the recognition of another grand feature in the principles of these institutions, which might be well and effectively carried out within the Manchester Unity. Owing to the very small number of members in each lodge, it is impossible, even under the best and most skilfully graduated Tables, that the lodges could be safely and firmly established if existing independent of each other. The following analysis has been made of the number of members in the various lodges during 1844, according to the classification described at pages 19 and 421 *ante.*

District.	Lodges.	Average Number of Members.	Number of Members in each Lodge.
Rural	1138	66,208	58
Town	1240	77,070	62
City	1304	99,747	77
Whole Unity .	3682	243,126	66

It requires but little practical knowledge to understand that many such lodges, as above, would be destroyed from the operation of other causes than inadequate contributions. The average number of members appears to be about 66 to each lodge; and it is apparent that, if three or four unhealthy members were to gain admission to any one of these, it must soon break down, even with highly graduated terms; but where lodges number ten or a hundred times as many members, there is but little danger to be feared from such accidents. One of the most valuable features to be introduced into the Order would therefore be the formation, either of all the lodges into one grand parent society, or of a certain number into districts, with united interests. The practical details for carrying out such a plan are perfectly simple; and the advantages to arise so obvious, that it deserves the best consideration of members.

The reports of the Blackburn and Preston districts of the Manchester Unity sufficiently prove the great hazard and risk attending small lodges or societies, and how uncertain must be their stability, from the marked fluctuations to which small numbers

are always subject. In January 1848, the Blackburn district consisted of 28 lodges, and 2109 members, or about 75 to each lodge; and in the preceding year they experienced 15,507 days' sickness, being about 7 days 8 hours to each. However, in one lodge, consisting of 57 members, the sickness in that year did not average more than 17 hours to each; but in another, having 47 members, the sickness averaged upwards of 35 days to each member, or about 50 times more than the other lodge; and 6 only of the 28 lodges experienced anything like a near approximation to the average result.

Again: in another report made by the Blackburn District, in which the sickness and mortality for the five years 1841–5 is furnished, it appears that even the average for the whole five years, in the various lodges, differs widely, being as high as 10 days 16 hours in one, and only 2 days 6 hours in another, while the average for the whole five years, for all the lodges collectively, was 5 days 20 hours. It is hence obvious that, even over a series of years, considerable fluctuations take place in the rate of sickness among individual lodges.

In the report of the Preston District Sick Union of the 19th of April, 1850, this subject is treated with much judgment, and a Table is furnished of the experience of the lodges in that district for two years, of which the following is an Abstract:—

The Average Amount of Sickness amongst the Members of the Preston Sick Union, Independent Order of Odd Fellows, M.U.

	1848-9.			1849-50.			Average for 2 years.	
Name of Lodges.	Number of Members.	Average amount of Sickness.		Number of Members.	Average amount of Sickness.		Average amount of Sickness.	
		days.	tenths.		days.	tenths.	days.	tenths.
1 Bee Hive	140	3	9	137	6	8	5	3
2 Traveller's Home	73	6	8	68	5	8	6	3
3 Good Design	140	8	1	124	7	6	7	8
4 Traveller's Rest	90	5	6	92	7	9	6	7
5 Evening Star	75	7	3	71	17	1	12	2
6 Pleasant Retreat	175	3	8	182	4	5	4	1
7 England's Glory	97	6	9	86	4	7	5	8
8 Industrious Bee	52	4	0	55	11	2	7	6
9 Mother to the Distressed	44	12	0	40	13	4	12	7
10 Widow and Orphans	60	9	7	55	9	0	9	3
11 Rose in the Valley	32	16	1	32	12	1	14	1
12 Poor man's Protection	22	3	3	22	14	2	8	7
13 Windsor Castle	83	8	7	84	7	7	8	2
14 Philanthropic	85	4	7		No Return.			
15 Morning Star	55	6	2	57	4	6	5	4
16 No Danger	70	10	7	60	8	5	9	6
17 Glorious Apollo	49	2	4		No Return.			
18 Prince Albert	24	2	4	61	1	7	2	0
19 Farmer's Glory	40	8	3	45	3	7	6	0

Over the period of two years, to which the above observations extend, the average sickness was 7·3 days, while in one lodge the ratio was 2 days to each member, and in another as much as 14 days. It is possible that some of the differences in the above Abstract may be due partly to other causes than the fluctuation of small numbers, since six of the above lodges had in the year 1848–9 less than 50 members, and in the following year there were four lodges with less than that number. The experience, therefore, of the most careless observer, must have shewn him the insecurity of every society with so small numbers; and it is to be hoped that the example of the Preston Sick Union will be speedily followed by other districts of the Unity.

The report already alluded to by the Board of Management is so important, that no apology is needed for giving it at length.

Report of the Board of Management of the Preston District Sick Union, Independent Order of Odd Fellows, M.U., presented to the Delegates assembled from each lodge in the Union, at the adjourned Special Meeting held at the house of Host Gerrard, the King's Arms Inn, on Wednesday Evening, the 10th of April, 1850.

"The Board of Management, in presenting a Report of the operations of the Union during the two years of its existence, deems it expedient to enter a little into detail upon the causes which led to its formation, and the principles upon which it is based.

"The extensive organisation, the rapid growth, and the unquestionable importance which the numerous secret and benefit societies of this country had assumed a few years ago, very naturally attracted the attention of members of other classes in society, than those more immediately connected with them. The soundness of the financial position of many, and particularly of the Independent Order of Odd Fellows (the most extensive and important of these institutions), had been the subject of much discussion; and many various and conflicting opinions on the subject were advanced. The great utility of societies of this character, and the vast amount of advantages they were calculated to confer upon society in general, and the industrious classes especially, provided their financial regulations were based upon sound scientific deductions from correct data, was however pretty generally acknowledged. Mr. Neison, the eminent actuary, in his "Contributions to Vital Statistics," published in 1845, acknowledges this, although he exposes many of the errors into which they had fallen, owing to the want of adequate scientific information. He says, (page 90,) 'An immense number of societies were formed in a very short period, and their contributions regulated by the most delusive and inadequate data; so at the present time very few are to be found calculated to survive many years. Under a scientific and amply developed system, those societies would be calculated, at no distant period, to completely remove the cause of nearly all that poverty, distress, and misery which haunt our manufacturing towns, and fill our workhouses with the working classes of the country; but, owing to the imperfect and unstable foundation on which they are at present built, instead of being a help and support to a poor man, they involve him in those difficulties for which he might otherwise have provided. On becoming a member of such a society, he reasonably looks forward to it as a support for his declining years, and a protection during periods of sickness and disease; but ultimately, at the very time when assistance is required, he discovers that the society has been formed upon a *ruinous plan*, that the increasing years and infirmities of its members have absorbed all its funds, and that those surviving must be thrown

destitute on the parish as a public charity.' That these observations are unfortunately but too true, is proved by the statistical Tables tendered by Mr. Barlow, of Birmingham, in his evidence before the Select Committee of the House of Commons, on the Friendly Societies' Bill, last year; which Tables were formed from actual evidence taken from the experience of the workhouses of Birmingham, Alresford, and Winchester Unions. Mr. Neison afterwards says, at page 138 of the same work, 'It is evident that the Order of Odd Fellows stands in need of much improvement; and considering that 33 Members of Parliament, and between six and seven hundred of the clergy, as well as many other elevated names, are said to be enrolled as members, it is remarkable that some gentleman of influence and scientific attainments should not before this have given attention to the lamentable condition in which his too confiding brethren of the Order are placed, and have done something to raise the Unity to the common level, at least, of the friendly societies throughout the kingdom.' This is certainly very sweeping language; yet if, on the one hand, it be granted, owing to the insufficiency and incorrectness of the materials upon which Mr. Neison, at that time founded his calculations, that the portraits he draws of Odd Fellowship, its position and prospects, presents a rather more unfavourable likeness than the reality warrants, yet, on the other, it must be confessed that there existed but too many causes to justify the sombre hue which he threw over it. That our financial system was of a purely fortuitous character; that our rate of contribution was inadequate to the realisation of the benefits promised, was flagrantly apparent to those who were in possession of any knowledge on the subject. It was and still is a question of the highest importance to the interests of the members themselves, that their true position should be correctly ascertained, and clearly and honestly exhibited before them. The active exertions of some of the friends of the Order caused considerable improvement to be effected at the Glasgow Annual Moveable Committee. The spirit of inquiry, once awakened, rapidly advanced in the right direction; and the demand for correct information on the subject has resulted in the compilation of Tables founded upon the Order itself. After these Tables shall have been presented to the Unity at large, doubtless many further important improvements will be cheerfully introduced.

"Following side by side with these steps of progressive improvement, the Preston District Sick Union was established for the purpose of remedying another defect in our constitution, which was calculated to be productive of as much disastrous consequence as the insufficiency of the contribution itself. The defect alluded to is the now admitted statistical fact, that there can be no certainty of permanency in independent societies of small numbers, a large extent of basis being absolutely necessary to approximate to anything like a certain average of liability. Mr. Neison, in his evidence before the Select Committee of the House of Commons, last year, is very explicit on this point. He says, 'Societies must have numbers sufficiently large, also, to warrant any process of calculation being applied to their guidance. If the society were very limited in its numbers, the wisest calculations would be of little use, because they would be disturbed by great fluctuations. It is quite possible that a society of 50 or even 100 members, using Tables that are perfectly safe to the average of all friendly societies, might not provide half the contributions that are necessary for its own peculiar circumstances, or it might provide double the amount which is necessary.' Again he says that, 'a society consisting of 1000 members might be perfectly safe upon a Table calculated upon known data:' but he afterwards says, 'that 100 would not be safe under any calculation. The result would be matter of accident; there would be fluctuations, and these might be towards the maximum or minimum.' Again he says, after alluding to the subject in detail at some length, the 'effect in the long run would be to amalgamate the smaller societies, making them into societies of greater numbers, in order to attain an average.' Mr. Neison grants that 'a society of 300 members might approach to safety;' yet it is evident that he prefers a much wider basis than even that. Indeed the principle is, the wider the basis the greater the

certainty of an average; the only limit being that it shall not become so extensive as to interfere with its judicious and efficient management.

"Many other parties amongst the ablest and most intelligent of the advocates of our Order, and its great and benevolent objects, have recommended, and are still continually recommending to us, the adoption of this principle, in some form or other. In a very elaborate and very favourable article on the subject of friendly societies, and particularly Odd Fellowship, published in the supplement to the 'Leeds Mercury,' of the 22nd Jan., 1848, after defending the Order from several groundless charges which had been preferred against it, the causes are analysed which operate to produce the rapid accumulation of funds in some instances, and the absolute insolvency of lodges in others. The writer afterwards proceeds to say: 'The remedy we would here respectfully suggest is simple and obvious, namely, the extensive union of the lodges of a district for the purpose of relieving the sick members out of one general fund —a practice already adopted by districts in the dispensation of funeral gifts, and which has been found to work very satisfactorily. By this simple expedient, the accidental burden which at present frequently involves single lodges in serious difficulties, would, by being spread over a large surface by means of a more extensive union of interests, be in a great measure averted; they would then cease to have a partial operation, and becoming amenable to the general law of life assurance, would be provided for without any difficulty out of the general funds of the society.' Mr. Sanders, of Birmingham, too, in his evidence before the Committee of the House of Commons, in reply to the question, 'What number (of members in a society) would you recommend?' said, 'I think the larger the better. I do not think your number can be too large,—a thousand or 10,000. We have 5000 in ours now.' In a very able article, written in the kindest and most favourable spirit, and published in 'Eliza Cook's Journal,' of the 16th of last month, after eulogising our objects, and giving us ample and full credit for the good that has resulted, and is still likely to result from such institutions, the writer, amongst other suggestions for our improvement, says: 'The security and reliability of benefit societies would also be increased by a combination of their now separate and distinct lodge funds into a united fund. At present, lodges with a preponderance of old members are avoided by the young, and the consequence very often is, that the old lodge, from the heavy sickness of its more aged members, becomes unable to meet the claims upon it, and the box is closed or it breaks up. Were the members of the various societies combined together in one grand union, and the rates made sufficient, any such calamity as this could not occur.' Although much of the evidence here produced has been published since the establishment of the 'Preston District Sick Union,' it was a conviction of the truth of the great principle therein enunciated, which led to its formation. Of course, like most other innovations upon ancient usages, the Union has met with some opposition, but by no means so much as might reasonably have been anticipated. The eminent actuary before quoted, says, 'There is a very great difficulty is persuading societies to immediately reform; and I think it is not to be wondered at that it should be so, because it is a difficult question really to comprehend; nothing but the lapse of time, the force of public opinion, and the question being frequently agitated, will ultimately bring about that amount of reform in their condition which is necessary.' The Board has every reason to congratulate the members of the various lodges on the progress which this most important question has already made in the public opinion.

"By the Table which accompanies this Report it will be clearly seen that our own practical experience for two years fully bears out the theory of the projectors and advocates of the union. The great uncertainty of liability in lodges of small number is exhibited so fully, that the most sceptical must immediately recognise the fact. Take the lodges numbered 12, 17, and 18, and then those numbered 9 and 11, the whole of which possess less than 50 members each. The minimum liability for the first year, is 4*s*. per member, and the maximum 20*s*. 1½*d*., above 500 per cent. of a variation!

Again, compare the first year of No. 12 with the second, and the result is a variation from 5*s.* 6*d.* each to 23*s.* 8½*d.*, proving that the very lodge itself which appears so very healthy during one period, may be in a very short time placed in the very reverse position! The second year presents a variation of a still more alarming character, the lowest liability being 2*s.* 10*d.* each and the highest 25*s.* 6½*d.*! By referring to lodges Nos. 1, 3, and 6, the largest on the list, and numbering between 100 and 200 members each the great principle of the Union begins to develope itself, that the broader the basis, the more certain is the average; the highest rate per year being 13*s.* 5½*d.*, and the lowest 5*s.* 9¾*d.* If we follow the operation of the broader basis to the whole extent of the Union, we arrive at the gratifying fact, that the variation almost entirely disappears, the difference in the average liability between each year being no more than eight pence! The average amount of liability of the whole district, too, and this is a highly important fact, approximates very nearly to the average of friendly societies in England and Wales. The Board is not yet in possession of sufficiently correct data respecting the ages of the whole of the members, to state the precise variation in this respect; but after another year's experience there is good reason to believe the difficulty will be removed.

"The Board alludes with regret to the circumstance, that two of the lodges which originally joined the compact thought proper to secede from it. It would perhaps be impossible to state with certainty what precise causes led to this result, but it is more than probable that to the difficulty to which Mr. Neison alludes it ought mainly to be attributed. Certain it is that it was not (in the opinion of the Board) through the discovery of sufficient reasons to confute the arguments in favour of the great principle on which the Union is based, nor from any unkind feeling between the members of the seceding lodges and those composing the rest of the Union.

"It is somewhat singular that there should have been much difficulty in rendering this principle clear to the perception of our brother Odd Fellows, particularly when it is taken into consideration that it has been recognised for some time by them with respect to the liabilities attending the mortality of the members. The Board feels confident that the facts here presented will have some weight with the more reflecting and intelligent of our brethren, and will stimulate them to further exertion in the holy cause of rendering our valuable and much cherished institution more permanent, and of more fully and efficiently practically developing the great principles upon which it is based. The Independent Odd Fellows will surely not lag behind the times in this age of discovery and progress, but will rather press forward in the van of the great intellectual army which is now so rapidly achieving the most glorious of conquests, the subjugation and ultimate extirpation of the great enemy of social, moral and physical progression, 'popular ignorance.' They will not, it is confidently asserted, imitate the example of the foolish bird in the desert, which, on the approach of danger, thrusts its head into the nearest bush, fondly believing that by blinding itself to the fact, the evil will cease to exist; but that they will rather, from the inmost chambers of their hearts, cheerfully echo back the dying words of the illustrious Goëthe, 'Let in more light;' that they will struggle more manfully and earnestly to prove that they are not undeserving of the high compliment lately paid to them *, that they are among the most *élite* of the working classes of this country both morally and intellectually.

"Signed on behalf of the Board,

C. HARDWICK, Prov. G.M., Chairman.
ROBT. RABY, Prov. G.M., Vice-Chairman.
THOMAS BINGHAM, Hon. Secretary."

* See "Eliza Cook's Journal" of the 16th March last (1850).

There is likewise a most remarkable example of the danger attendant on the management of small societies, to be drawn from the Quarterly Report for October 1845, of the Manchester Unity. The following is a brief Abstract which I have made of some of the more striking and anomalous results, an attentive consideration of which must shew how very much subject to fluctuation is the mortality, when viewed in connection with small numbers.

District.			Number of Lodges.	Number of Members.	Deaths.	Rate of Mortality being one in
Towns of which the Population is	under 5,000	Bourne	18	1116	10	112
		Bramley	12	1063	13	81
		Bollington	2	154	40	3·8
		Chepstow	3	109	9	12
		Edmonscote	23	1270	11	115
		Great Driffield	10	753	1	753
		Horseforth	5	469	6	78
		Knaresboro'	11	933	10	93
		Leominster	13	712	0	...
		Middleton and Hywd	13	1466	16	91
		Mottram	7	687	7	98
		Pottery	23	2162	26	83
		Ruthin	11	484	7	69
		St. Helen's	20	1056	12	88
		Jedburgh	4	534	7	78
		Staleybridge	8	645	15	43
		Thirsk	5	292	5	58
		Thorne	1	47	2	24
		Wigton	6	312	5	62
	5,000 and under 30,000.	Bedford	23	1341	4	335
		Bury St. Edmunds	22	1110	3	370
		Carmarthen	24	965	15	64
		Carnarvon	11	347	8	43
		Chester	7	454	13	35
		Gloucester	10	471	12	39
		Rotherham	13	946	3	315
		Southampton	9	708	3	236
	30,000 and under 100,000.	Bath	20	1275	4	319
		Bolton	29	3209	19	179
		Bradford	30	3409	31	109
		Dudley	37	1754	14	125
		Nottingham	32	2609	19	137
		Preston	24	2103	16	131
		Rochdale	33	3046	0	...
		Sheffield	29	2372	22	108
	100,000 and upwards.	Birmingham	91	6064	53	114
		Bristol	50	2318	25	133
		Edinburgh	20	2565	13	197
		London	129	9381	51	145
		Stepney	20	1285	8	160
		Salford	24	3065	24	128

It is to be borne in mind that the preceding figures relate to whole districts, embracing each on an average 22 lodges; and if the fluctuation be so very remarkable in relation to the combined results of whole districts, how great must be the danger in which individual lodges, having to meet their own liabilities, are placed! There is, perhaps, no improvement of which the Manchester Unity stands in more need, than the distribution, in whole or in part, of the fluctuations to which lodges are subject over districts sufficiently large to guarantee average results.

One point of importance in the management of lodges, is the proper investment of their funds. The preceding calculations and premiums would be inadequate to carry out the purposes intended, unless 3 per cent. compound interest, at least, be realised on the surplus funds, without any deductions for expenses of management. A single illustration will be sufficient to illustrate the great accumulations expected to arise from such mode of investment. Take the case of a young man entering a lodge at age 30:—he will have an equal chance of living 39 years; or in other words, of 100 members entered at that age, one half of them would live to attain 69 years of age, and during that period each would experience 115 weeks of sickness. Presuming that the funds were not invested at interest, each would be required to pay down £115 to enable the society to pay £1 per week during sickness; but on referring to Table AS it will be found that £68 14*s.* 6*d.* is all that is required to enable the society to meet its liabilities, provided the funds are improved at 3 per cent. compound interest. Again: if the question of mortality be considered, proof of the same advantages will be found. It is evident that, if money made no interest, according to Table AL, each member, on entering, would need to pay down £100 in order to provide £100 at death; but because, in calculating the same table, monies are assumed to improve at 3 per cent. compound interest, £37 8*s.* 4*d.* only is required.

In connection with the preceding remarks relative to sickness, it may be stated that in a recent number of one of the periodicals connected with the Order, a letter appeared setting forth a statement, that about 32 weeks was the amount of sickness required to terminate life in country as well as town; and from this starting-point a number of strange deductions and most fallacious conclusions were drawn, with a view of shewing that the proposed scale, No. 2, would be adequate, with good management, for a town lodge. It is surprising that this statement should have passed muster, and that the fallacy escaped the detection of the talented editor. It was only necessary to refer to the last October Report, issued by the Board of Directors, for a refutation of so dangerous a fallacy. It will be there found, as given in Table Y of this Contribution, that during 1844 there were 2286 deaths of members, and 226,917 weeks' sickness. From these two results it is therefore obvious, that during that year there was no less than 99 weeks' sickness to each death, or more than three times that stated by the writer in question. If the foundation of his argument be so much at fault, it is equally evident that his

recommendation relative to the adoption of scale No. 2 merits little confidence. The fact that there are more than 32 weeks' sickness to each death, can be proved by the results given at page 450 of this Contribution, in which that particular question has been investigated for the mortality and sickness at each term of life. At age 30 it will be found that there is about 116 weeks' sickness to each death. This differs from the results in the whole Unity, but the difference admits of a simple explanation, for on referring to pp. 421 and 493 of this volume, it will be found that the value of life in the Order is not quite so great as in the other friendly societies, and hence the somewhat shorter duration of life in the Order exposes the members to a less amount of sickness. The method, however, of taking a general average of sickness to the deaths, without regard to age, will be found subject to another error; for it will be seen that while at the period of life 31–35 there are 116 weeks' sickness to each death, at the term of 60–70 there are no less than 252 weeks to every death. An extension of this argument may be found useful in the management of the Order, for as the ages of the members increase, so also will the ratio of sickness increase in a higher ratio than the deaths; and although at the present time there are nearly 100 weeks of sickness for one death, in a few years, when the ages increase, it may happen that there will be 150 weeks' sickness for every death. On referring to the results given in Tables E and L, pp. 27 and 77, it will be found that, taking the population of friendly societies in England and Wales, as actually distributed, there are 157 weeks' sickness to each death, and in Scotland 145 weeks. These results differ slightly from each other, because there is a variation in the distribution of the two populations over the various periods of life. In the former, the greater number of old members has a tendency to increase the average amount of sickness. An extension of those arguments and figures has shewn in Table A G that of the male population of England and Wales above 10 years of age, 261182, or 4·5257 per cent., are constantly sick.

It has been often said, that the deficiencies in the rates of contribution will be amply compensated by the donations to the society, and the number of members who never seek relief from it. The latter part of the argument clearly falls to the ground, as the actual amount of relief given is quite equal to that anticipated by the Tables; and as to the benefits to be derived from donations, which some have represented erroneously at 20 per cent. of the whole income, it will be found that the amount from all sundry items not only does not help the contributions of the Order, but is inadequate to meet the expenses of management, being only 42 per cent. of that amount. It is, therefore, imperative on the Order, so far as donations are concerned, to graduate their rates on a scale equivalent at least to that given in the Tables already referred to.

Another argument frequently brought forward in favour of low rates, is the relief which the funds of lodges will experience by allowing only a reduced rate of aliment in long continued sickness. This argument can only be viewed as a desperate expedient to prop up a falling institution, and not calculated to afford any adequate support. The

first question which would naturally arise in an intelligent mind, is the practicability of applying such a principle to life contingencies, and the possibility of calculating the average duration of each attack of sickness at various ages. Unless the solution of this last question be first accomplished, it is evidently nothing short of quackery to proceed by random in the management of a society or lodge, under the blind belief that a reduction of aliment in long continued sickness will produce the great benefits to the funds which has been so often argued. No writer on Vital Statistics has yet solved the problem, and therefore means are not at present available to aid or warrant any one in stating the particular amount of relief which would be afforded by the introduction of such regulations. From the data and facts, however, given in Tables N N, O O, P P, and Q Q, enough is known of the subject to satisfy any diligent inquirer, that practically the funds of a lodge would be but little influenced by any such circumstances, except at very advanced periods of life, at which it will be presently shewn that a much better remedy or cure is available on scientific and understood principles, and that there is no need therefore of having recourse to expedients of a doubtful nature. It may, however, be here mentioned, that although much information has been given in the preceding on the question of the duration of each attack of sickness, still in anything like a complete form it is now for the first time, under investigation, with a view to publication, but in the meantime, and at this stage of the question, inspection of the second and fourth columns of the Table R R, page 450 of this Contribution will satisfy any one of the little practical advantage to result to a lodge or society by the adoption of such a regulation, while it must occasionally be attended with most serious injury to individual members. As formerly remarked, the great and essential and noblest feature in friendly societies of every description, is the certainty that under a skilfully developed system they will afford to members a competent support and complete independence, during sickness and disease. Admitting this integral element to have its full weight, and keeping in view the fact that in the Order itself the average full allowance in sickness is a little under 10*s*. per week, it becomes a serious question, whether the great principle of such an institution is not violated by admitting the existence of a regulation, which in the prime of life may reduce the support of an industrious workman, with possibly a large family, to the miserable pittance of 5*s*. weekly. It is evident that this would constitute pauperism itself. To these observations it may be replied, that the very fact of the principle affording but little relief to the funds, goes to shew that but few of the evils here detailed would occur. This, no doubt, is perfectly true; still individual cases must occasionally arise, and no society or lodge can be justified in admitting a principle which can possibly subject any one of its members to so hard a fate.

It is obvious that, if it be necessary to reduce allowances in long-continued sickness, such reduction will most effectively aid the funds in the advanced term of life; and fol-

lowing out this idea, it will be found that another principle is available, which is free from the objections of the preceding scheme, and at the same time fraught with most important monetary advantages to the members individually and collectively.

In an advanced period of life, say after age 70, it will always be a more difficult matter to define sickness than during an earlier period; and in the management of all benefit institutions which have existed long enough, this has been found a most serious practical difficulty, and so much felt, that up to the appearance of the present calculations no sickness Tables went beyond that term of life. Carrying out this view, it will be found, that by relinquishing sick allowances after 70 years of age, or any other term of life that may be fixed on, the practical management of lodges will become much simplified, their constitution strengthened and rendered more secure, and the moral character of the members exposed to less temptation.

The first part of the question to which we shall direct attention is that by which it will be seen that, under the plan of discontinuing the sick allowance at age 70, and substituting a deferred annuity at that age of one-half the amount of the weekly sickness allowance, the contributions from members would be very nearly the same as those which would be required to provide for a sick allowance to the extreme of life. In this instance we shall take the case of a member entering a lodge at age 32, the average age of the members in the Unity; and we shall further suppose that all his contributions will close after attaining age 70, and determine the yearly payment required under both conditions.

In the first place, to provide for the various benefits, including a sickness allowance to continue during the *whole period* of life:—

Payment for 10*s.* weekly sick allowance*	=	£1	16 6
£10 at the death of a member	=	0	3 11
£5 at the death of a member's wife	=	0	1 5
Total yearly payment	=	£2	1 10

In the next place, to provide for the same benefits, but including a sickness allowance up to age 70 only, and after that period a deferred annuity:—

Payment for 10*s.* weekly sick allowance	=	£1	1 9
£10 at the death of a member	=	0	3 11
£5 at the death of a member's wife	=	0	1 5
Annuity of 5*s.* weekly after age 70	=	0	16 0
Total yearly payment		£2	3 1

* See Table A S, p. 480, col. 6.

It will thus be found that while, by the former method the yearly payment would be £2 1*s.* 10*d.*, by the latter plan it would be increased only 1*s.* 3*d.* yearly, but the latter would possess advantages of a very high order over the other.

First, it would exercise a salutary check on imposition and fraud. There can be no doubt that numbers often enter lodges having concealed ailments, and defects of health and constitution not easily detected; and in every such case, were it a condition or regulation of the lodge that a member providing a sickness allowance must also contribute for a deferred annuity of at least one-half the amount, a protection would be formed against the undue expenditure of the funds. For if his health be so defective as to cause him to make unusual claims on the sickness fund, that very same feature would render his life of shorter duration, and consequently give him an inferior chance of becoming an annuitant; and the loss on the one fund would be, therefore, compensated by the gain on the other.

In the second place—a gigantic institution like the Manchester Unity would reap an advantage by being thus enabled to adopt a uniform scale for all districts; for, as may have been observed in a preceding illustration, if, in the City and Town Districts, an increased amount be paid in the shape of sick allowance, it must follow that fewer claimants will arise for annuities; so that if one well developed scale were provided, it would be equally applicable to all districts. In the next place, a universality would be given to the sphere of action of the Unity, by the freedom with which the members of various trades and occupations might be admitted into the lodges. There would not then exist the same necessity for that stringent exclusion of persons of particular callings, usually thought unhealthy, as the liabilities of lodges from sickness, and from annuities, would have a constant corrective influence on each other.

The merits of this plan over that at present in force seem to be quite apparent. It will enable the lodges to determine their liabilities with more precision, and very much simplify and improve the system of management; while the members will be removed from those temptations to fraud and imposition, in the advanced periods of life, which so easily connect themselves with benefit and provident societies. On attaining 65 or 70 years of age, or any other period at which it may be agreed the annuity should commence, the member will regard it as a permanent and standing allowance; and no scheming, or pretence of sickness, can have any tendency to increase that amount; those temptations being absent, there is every reason to believe that the relative position of all parties to each other would be improved, and a higher tone of moral feeling induced, as well as a more elevated social rank in society.

According to the present scheme of the Unity, members living beyond the age of 70 have still to continue their contributions or payments as before; but the preceding plan would relieve them from that burden. Again, the human constitution, as a general rule, is then still capable of sustaining considerable labour; the annuity is equivalent to the payment of 26 weeks yearly, of full pay in sickness; but during the succeeding ten years,

the sickness will average about 20 weeks yearly, and the remaining portion of the year will therefore be open to any avocations a member may be able or choose to follow, uncontrolled by the society or the surveillance of its officers. It may not be out of place to allude here to the duty which devolves on the officers of the Order, as the organs of a great public body, to endeavour to elevate the character and improve the circumstances of its members generally. Men, if they provide for their immediate wants, are very apt to overlook every provision for the winter of life; and it is no mean expression of the prudential feelings of the working classes of this country, to find above one quarter of a million enlisted in the ranks of one great mutual-supporting institution. It is said that not more than 130,000 members of the upper and middle classes have yet availed themselves of the benefits of life assurance. What a brilliant contrast do we then find on the part of the poorer classes of the country, in the host of persons enrolled as members of one description or another of friendly societies! The officers of the Manchester Unity ought to feel themselves under high and weighty responsibilities; they are called upon to take up a grand scheme of financial reform, and to propound it in clear and calm language to the members of the Order. The whole plan of the benefits and contributions should be remodelled, on the ground of the necessity for such a step in order to secure the stability of the Unity, and the manifest advantages thence to arise to its members and their families. If the habit of discussing and of practically providing for deferred annuities were once established, the most beneficial results would follow, and those engrafted on the succeeding generation might raise the Order into one of the noblest institutions of the times.

Recently it has been attempted to puff up the merits of the Order, on its charitable features and constitution. This is a species of advocacy in which the more enlightened and recognised supporters of Odd Fellowship should cautiously avoid participating. It ought never to be lost sight of, that thousands of members hold vested rights and interests in the Unity, and that these should be satisfied before other claims can legitimately arise. "Be just before you are generous" is perhaps the best reply to such enthusiasts. The merchant or tradesman who squanders his property on charities and other purposes, however laudable in themselves, would meet with but little sympathy should he do so at the expense of his creditors. So also with the Unity: young men in the vigour of health are induced to become members, and in a few years afterwards discover that they have been entrapped into a bankrupt society, which attempts to justify its fallen condition by the liberality of its charities. With what warmth and sincerity of feeling can those persons regard such a species of management? The great question of questions is the stability of the Order; and if the essential elements of security are wanting, not only will its charities disappear, but the Unity itself, with all its boasted blessings, be forgotten with other bubbles and visionary schemes. Let the terms of membership be such as will effectually carry out all the purposes contemplated; let every member of the Unity feel warranted in stating to his friend and neighbour—"In this society is exercised the highest order of

prudential feelings; every care has been taken to justify me in asserting, that whatever is promised to our members can with certainty be fulfilled. Join us at once: our weekly or monthly payments are small, but their accumulations will afford you in after years, and during periods of sickness and distress, a comfortable support, which you can demand as the just and merited reward of your own honest and industrious savings. It is the simplest and cheapest way of guarding against the calamities of sickness and disease, and affords the only available means to a working man of providing for the vicissitudes and infirmities of old age." If every member could at the present time, in honesty and good faith so express himself,—for the hundreds that now join the Order, thousands would become members, and the Unity outgrow in magnitude the most sanguine expectations of its advocates. Charity truly "covereth a multitude of sins;" but it is much to be feared that, unless immediate measures be taken to retrieve the lavish expenditure of the Order, its too much boasted charities will, by all right-thinking men, be classed among its follies and its extravagancies.

One of the most efficient means of awakening attention to the perilous condition of the Order, would be the periodical publication of well digested records of the experience of the various lodges, from the most remote periods of which their books would admit; and a proper and skilful analysis of those, extensively circulated, could not fail to give birth to much useful conversation and debate, ultimately resulting in important and highly beneficial reforms. Science would also be greatly aided by the facts and testimony of such records, and the literature of the Order acquire an importance in the community not otherwise easily attainable. The expense to each lodge of contributing its experience would be very trifling, while the advantages to the Unity would be immense.

These remarks were written in 1845; but, from what has been stated at the beginning and in subsequent portions of this Contribution, it will be seen that the course pointed out has been strictly followed; and it is earnestly hoped that every district in the Unity will now seriously discuss the subject, and avail themselves of the information drawn from the experience of the Order. The bulk of these remarks was written about ten years ago: they have been tried by the severe test of the practical working of the lodges in the Manchester Unity itself; and it must be obvious that the suggestions originally offered for the consideration of Odd Fellows, are at the present time equally applicable to the state and condition of the Order. And although individual districts have effected considerable improvements, the greater number of them stand in as much need of redress as ever. The recent Act, the 13th and 14th Vict., cap. 115, carried through Parliament by the benevolent and public-spirited efforts of Mr. Sotheron, Member for North Wiltshire, has placed Odd Fellow societies in a much better position than formerly; and it is hoped that the legal protection now granted to them by the legislature, will also have the effect of calling attention to their financial condition, with a view of placing their monetary affairs on a stable foundation, so as to justify the friends of provident institutions in recom-

mending Odd Fellow lodges to the approval of the public. There can be no doubt that there are very few lodges in the kingdom, at present, in so hopeless a condition that, under proper guidance and advice, they might not right themselves, and yet become strong and powerful. Still, the financial condition of many is most desperate; and nothing short of immediate and strenuous efforts will suffice to place them on a safe foundation. Delay will therefore be dangerous to most, and certainly fatal to many. Let every lodge, therefore, or, if possible, each district, hold immediate meetings, to consider what effect the recent information promulgated by the Order will have on their financial condition. A patient examination of it cannot fail to convince every one of the necessity and urgent reasons of reform; and such changes should not be effected loosely, but be carried out under the advice of competent authorities accustomed to consider such questions, and devoting their attention to the practical management of benefit societies. The Odd Fellow lodges and districts which have recently made efforts to place themselves on a sound and stable foundation, have experienced no serious difficulties in doing so; and there is no reason to think that the generality of other lodges and districts would find any greater obstacles in the way of improvement.

One course, at the present juncture, is clear, and open to every member. It must appear to be his bounden duty to raise his voice against the admission of new members on any other terms than those which science and experience prove to be safe and equitable. To do otherwise, can be described in its mildest form as nothing short of a fraud on the public. It is a great, and to some extent a difficult question, to remedy the evils incidental to the Order, so far as existing members are concerned; but as to future members there cannot possibly be any doubt or difficulty. There are numerous authorities in the country calculated to give sound and trustworthy advice on the course to be followed; and why should not these be consulted at a time when the most serious alarms are sounded in every quarter? Members should calmly reflect, that the radical and scientific part of the question is neither a very simple nor a very generally understood one, even among the most highly educated classes; and it can therefore be no reflection on the intelligence of any individual member to seek for advice elsewhere.

It is quite impossible to govern the Order on sound principles under the present mode of payments. The risks incurred under different classes of members have been shewn to vary, and the difference of age at admission proved to have a great influence over the magnitude of the risks. The truth of no fact has been better established. It is therefore only just that members should pay in proportion to the risks they impose on the lodges; and under the present uniform amount of periodical contributions by members of all ages, this is rendered impossible. For if a member at age 20 be required to pay £2 7*s.* (see Table A S) for an allowance of £1 per week during sickness, one entering at age 40 ought to pay £4 13*s.* 6*d.* yearly; but suppose he were admitted on the same annual payment as the other, in order to compensate for the loss which the old age

would thus sustain, an entry-money or fine of no less than £41 12*s.* 9*d.* would be required; or if the allowance in sickness were only 10*s.* per week, one half that amount of entry-money. It is needless to remark, that it would be quite impracticable to get workmen generally to pay such sums; at younger ages the entry-money would be less, but still too high and practically exclusive. At 30 years of age the entry-money for £1 per week in sickness would be £17 8*s.*, and for 10*s.* per week £8 14*s.*

This will be enough to expose the folly of proposing to admit members of all ages on a uniform scale of payments. No other course is open but to have rates graduated according to age. There may still, from other considerations, be an entry-money of a small amount enforced, but not sufficient to make up for the differences of age. The above illustrations apply only to the sick allowance; but if the provision or assurance at death had also entered into the question, the entry-money would have been higher, and the difficulty increased. Arrangements might also be easily made to admit of every member paying according to his means, and receiving proportionate benefits, and thus embrace every class of the community.

It is evident that the Order of Odd Fellows stands in need of much improvement; and considering that thirty-three Members of Parliament, and between six and seven hundred of the clergy, as well as many other persons of elevated rank, are said to be enrolled as members, it is remarkable that some gentleman of influence and scientific attainments should not, before this, have given attention to this lamentable condition in which his too confiding brethren of the Order are placed, and have done something to raise the Unity to the common level, at least, of the friendly societies throughout the kingdom.

It is hoped that, while the preceding observations will satisfy the members of the Manchester Unity of the great need of immediate reform, and in some degree assist in establishing their institution on a secure foundation, other friendly societies may also derive from them useful suggestions for their future guidance.

There is another class of societies which attempts to carry out the general principles of friendly societies; but they are like the Odd-Fellow Societies, modelled after the very rudest shape in which benefit clubs were formed fifty years ago: and so far as relates to their contributions and benefits, scarcely anything further is necessary to be stated. "Rechabite" is the name by which those societies are known; and every member has to come under an obligation to abstain from intoxicating liquors, and to discountenance, by every lawful means in his power, the drinking usages of society.

The terms on which members are admitted are according to the following scale:— entry money at age 16 is 5*s.*, and at age 40 it increases to £2 10*s.*; the monthly contribution, for all ages, is 1*s.* 4*d.*, or 17*s.* 4*d.* annually. The benefits promised are an allowance of 10*s.* per week in sickness, and a deferred annuity of 5*s.* weekly after 70 years of age. To young members entering the Rechabite societies, or tents, as they are termed, at the age of 16, the actual premium for the above benefits, making allowance for entry

money, should be £1 2*s.* annually; at age 40, also allowing for entry money, the annual premium should be £2 10*s.* 2*d.*

It will thus be seen, that, by the youngest member at sixteen, there is an ultimate loss of 4*s.* 8*d.* annually, and by the member aged 40 there is a loss of £1 12*s.* 10*d.* annually, provided that it were possible to sustain such losses; but it is needless to add, that permanence is not to be expected with societies so constituted. Not only do the Rechabite societies, in common with Odd-Fellow societies, perpetrate an injustice on the younger members by the above disparity in the payments; but that injustice is further augmented by levying a uniform tax of 3*s.* yearly, without distinction of age, for funeral money, the sum of £10 being payable on the death of each member. The discouragement given to drinking usages, and the practice of temperance enjoined by Rechabites, is deserving of every support, and is well calculated to increase the comforts and elevate the moral and political condition of the working classes; and it is the more to be regretted that the monetary foundation on which the societies are built should be destined to effect their overthrow at so early a period.

A class of societies, of which there are about two thousand in the kingdom, pass under the name of Courts of Foresters, and to the ratio of sickness experienced by them attention was directed in page 465 *ante*, their object to provide against the calamities and vicissitudes of sickness and death; members are admitted between the ages of 18 and 38, on the same terms, and participate, to the same extent, in the benefits offered. It is therefore unnecessary to add anything to what has already been remarked of Odd-Fellow and Rechabite societies, as the same observations are equally applicable to all.

The illustrations of the condition of the various grades of friendly societies, given in the preceding pages, have been made as general as possible, in order to insure their being readily understood by the members, to whom they were more particularly addressed. It will be necessary, in every instance where any practical application is made of the facts presented, to use every caution in the selection of those examples which strictly belong to the case in point; and it is hoped that the marked differences which have been shewn to prevail between the rates of mortality and sickness, under the many modifications as to condition and peculiarity of employment and rank in society, will be a sufficient guarantee against the indiscriminate use of the general results for the government of individual classes, whose circumstances differ widely.

Should these Contributions in any degree advance the science of Vital Statistics, and place the provident and self-supporting institutions of the people on a more permanent foundation, the highest wish of the writer, in venturing on so important a subject, will be consummated.

AUXILIARY TABLES OF RATES AND CONTRIBUTIONS.

The monetary Tables given in pp. 470–81 *ante*, have an extensive application, and will be found to be exceedingly useful, but that the large body of data contained in these Contributions may be still more generally applied to all classes of provident institutions the following auxiliary Tables are given.

In pp. 205–17 *ante*, formula and examples were given for the construction of mortality Tables, and, in pp. 148–9 and 494–6, were also given formula and examples of the construction of auxiliary Tables, but these were by the direct and not the continuous mode of calculation. The determination of the figures in the D column of the preceding Tables was accomplished by an independent calculation for each result, and was not affected by those for other ages, but in the construction of the next ten Tables a continuous calculation, by the method of series, has been preferred, and the formula employed will be found in the next page. One great advantage to be derived from this method is that, if an error should enter into any step of the calculation throughout the Table, it will affect the whole of the subsequent results, and as a few minutes will suffice to perform the direct calculation for any given age by the method given in pp. 148–9 *ante*, the agreement or difference between the results of the two methods will shew whether the whole Table, by the continuous method now followed has been properly constructed or otherwise.

The explanations, formulæ, and examples furnished in pp. 544–50, in respect to the construction of auxiliary Tables on joint lives, may be usefully studied in connection with the illustrations given in the two following pages. There is also a very interesting and curious example of the practical application of the continuous method of calculation given in one of my Reports on the Bengal Military Fund, namely, that dated the 13th November, 1854.

The following formula have been employed in the formation of Tables **1** to **11** inclusive, and also with the necessary modifications in the construction of the subsequent auxiliary Table on joint lives:—

$$D_x = l_x v^x$$

$$\lambda.D_x = \lambda.l_x + \lambda.v^x$$

$$\Delta\lambda.D_x = \lambda.p_x + \lambda.v = \lambda.v p_x,$$ the values of which, at seven per cent., will be found tabulated in Table **12**, column 7.

$$\lambda.D_{x+1} = \lambda.D_x + \Delta\lambda.D_x,$$ and

$$N_x = \Sigma D_{x+1},$$ also in

Table **2**	v	$= (1{\cdot}03)^{-1}$	$\lambda.v =$	9·9871627 75295
3	v	$= (1{\cdot}035)^{-1}$	$\lambda.v =$	9·9850596 50207
4	v	$= (1{\cdot}04)^{-1}$	$\lambda.v =$	9·9829666 60701
5	v	$= (1{\cdot}045)^{-1}$	$\lambda.v =$	9·9808837 09553
6	v	$= (1{\cdot}05)^{-1}$	$\lambda.v =$	9·9788107 00930
7	v	$= (1{\cdot}06)^{-1}$	$\lambda.v =$	9·9746941 34735
8	v	$= (1\ 07)^{-1}$	$\lambda.v =$	9·9706162 22315
9	v	$= (1{\cdot}08)^{-1}$	$\lambda.v =$	9·9665762 44513
10	v	$= (1{\cdot}09)^{-1}$	$\lambda.v =$	9·9625735 02059
11	v	$= (1{\cdot}10)^{-1}$	$\lambda.v =$	9·9586073 14842

l_x = Number living at the age x in the second column of Table C (Males), pp. 5–6 *ante*.

Also v^x = Present value of £1 due x years hence.

In order, however, to simplify the construction of Tables **2** to **11** inclusive and also the subsequent Tables on joint lives, a Table, of which the following is a specimen, was formed to determine

$\lambda.p_x = \lambda.l_{x+1} - \lambda.l_x$; $\lambda.p_x$ is constant for the same age throughout the whole of the Tables at whatever rate of interest they may be calculated.

$\Delta\lambda.p_x = \lambda.p_{x+1} - \lambda.p_x$

$\lambda'.p_x =$ co. log. p_x

$\Delta\lambda'.p_x = \lambda'.p_{x+1} - \lambda'.p_x$

p_x = Probability of living one year at age x.

The successive $\lambda.D_x$ in the following Tables were produced by the continuous addition to the initial $\lambda.D_x$ at the top of each column of $\lambda.p_x$, and also the constant $\lambda.v$; but the same would obviously have been accomplished by the continuous addition of simply $\lambda.v p_x$, the values of which, at seven per cent., will be found in Table **12**, column 7.

Table 1,

Being preliminary to the Construction of Tables **2–11** *inclusive.*

Age x	l_x	$\lambda.l_x$	$\lambda.p_x$	$\Delta.\lambda p_x$	$\lambda'.p_x$	$\Delta\lambda'.p_x$	$\lambda.v^x = \lambda.(1{\cdot}07)^x$		Age x
10	100000	5·0000000	9·9965511	0·0003913	0·0034489	9·9996087	9·7061622	23150	10
11	99209	4·9965511	·9969424	·0002980	·0030576	·9997020	·6767784	45465	11
12	98513	·9934935	·9972404	·0001966	·0027596	·9998034	·6473946	67780	12
13	97889	·9907339	·9974370	0·0000790	·0025630	9·9999210	·6180108	90095	13
14	97313	·9881709	·9975160	9·9999541	·0024840	0·0000459	·5886271	12410	14
15	96758	·9856869	·9974701	·9998217	·0025299	·0001783	·5592433	34725	15
16	96196	·9831570	·9972918	·9998093	·0027082	·0001907	·5298590	57040	16
17	95598	·9804488	·9971011	·9998100	·0028989	·0001900	·5004757	79355	17
18	94962	·9775499	·9969111	·9998249	·0030889	·0001751	·4710920	01670	18
19	94289	4·9744610	·9967360	·9998442	·0032640	·0001558	9·4417082	23985	19
97	141	2·1492191	·8001709	·9986271	·1998291	·0013729	7·1497735	64555	97
98	89	1·9493900	·7987980	·9970820	·2012020	·0029180	·1203897	86870	98
99	56	·7481880	·7958800	9·9822713	·2041200	0·0177287	·0910060	09185	99
100	35	·5440680	·7781513	0·0135728	·2218487	9·9864272	·0616222	31500	100
101	21	·3222193	·7917241	9·9974225	·2082759	0·0025775	·0322384	53815	101
102	13	1·1139434	·7891466	0·0067334	·2108534	9·9932666	7·0028546	76130	102
103	8	0·9030900	·7958800	9·9822713	·2041200	0·0177287	6·9734708	98445	103
104	5	·6989700	·7781513	9·7447274	·2218487	0·2552726	·9440871	20760	104
105	3	·4771213	9·5228787	...	0·4771213	...	·9147033	43075	105
106	1	0·0000000	...	...	...	...	6·8853195	65390	106

Abstract shewing the process of calculation adopted in the Construction of Tables **2–11** *inclusive.*

Specimen of the actual Calculation of Table **8**, in which $v = (1{\cdot}07)^{-x}$.

Age x	$\lambda \cdot D_x$ $\lambda \cdot p_x$	D_x	N_x	$\lambda \cdot N_x$	Age x	$\lambda \cdot D_x$ $\lambda . p_x$	D_x	N_x	$\lambda \cdot N_x$
10	4·7061622 9·9965511	50834·93	638415·36	5·8051634	97	9·2989927 9·8001709	·1990640	·2803795	9·4477462
11	·6733295 ·9969424	47133·47	591281·89	·7717946	98	9·0697798 ·7987980	·1174302	·1629493	9·2120525
12	·6408882 ·9972404	43740·95	547540·94	·7384166	99	8·8391940 ·7958800	·0690548	·0938945	8·9726402
13	·6087448 ·9974370	40620·46	506920·48	·7049398	100	·6056902 ·7781513	·0439358	·0508587	·7063653
14	·5767980 ·9975160	37739·67	469180·81	·6713402	101	·3544578 ·7917241	·0226182	·0282405	·4508724
15	·5449302 ·9974701	35069·55	434111·26	·6376011	102	8·1167981 ·7891466	·0130857	·0151548	8·1805502
16	·5130165 ·9972918	32584·92	401526·34	·6037140	103	7·8765609 ·7958800	·0075259	·0076289	7·8824619
17	·4809246 ·9971011	30263·88	371262·46	·5696811	104	·6430571 ·7781513	·0043960	·0032329	7·5095923
18	·4486419 ·9969111	28095·83	343166·63	·5355051	105	7·3918246 9·5228787	·0024650	·0007679	6·8853196
19	4·4161692 9·9967360	26071·69	317094·94	5·5011892	106	6·8853196	·0007679	·0000000	...

After this explanation the "headings" of the different Tables will sufficiently shew the other details of their construction. The various Tables were, at frequent intervals during the progress of their formation by the preceding method, checked by the direct mode of calculation employed in forming Table VI, page 149 and Table A U, page 494, *ante*.

Table 2.

England and Wales.—Whole Population.—Single Lives.—Males.—Three per Cent.

Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x	Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x
10	4·8716278	6·2354703	74409·40	1719770·49	59	3·9836213	5·0263583	9629·890	106257·227
11	·8553416	·2169836	71670·69	1648099·80	60	·9589718	4·9874816	9098·542	97158·685
12	·8394468	·1983835	69095·03	1579004·77	61	·9335836	·9473199	8581·903	88576·782
13	·8238500	·1796515	66657·65	1512347·12	62	·9073405	·9057856	8078·681	80498·101
14	·8084498	·1607722	64335·37	1448011·75	63	·8801905	·8627811	7589·104	72908·997
15	·7931285	·1417338	62105·28	1385906·47	64	·8520006	·8182051	7112·145	65796·852
16	·7777614	·1225304	59946·16	1325960·31	65	·8227032	·7719450	6648·187	59148·665
17	·7622160	·1031610	57838·36	1268121·95	66	·7921500	·7238833	6196·551	52952·114
18	·7464799	·0836251	55780·18	1212341·77	67	·7602918	·6738855	5758·267	47193·847
19	·7305537	·0639323	53771·69	1158570·08	68	·7269627	·6218092	5332·891	41860·956
20	·7144525	·0440516	51814·64	1106755·44	69	·6920908	·5674914	4921·424	36939·532
21	·6981955	·0240113	49910·91	1056844·53	70	·6554714	·5107603	4523·467	32416·065
22	·6818030	6·0037974	48062·13	1008782·40	71	·6169852	·4514212	4139·858	28276·207
23	·6652812	5·9834072	46268·05	962514·35	72	·5763679	·3892720	3770·231	24505·976
24	·6486224	·9628367	44526·89	917987·46	73	·5334695	·3240840	3415·620	21090·356
25	·6318231	·9420825	42837·40	875150·06	74	·4879703	·2556216	3075·886	18014·470
26	·6148994	·9211400	41200·20	833949·86	75	·4397274	·1836106	2752·501	15261·969
27	·5978726	·9000030	39616·18	794333·68	76	·3883024	·1077810	2445·132	12816·836
28	·5807553	·8786645	38085·12	756248·56	77	·3334634	4·0278288	2155·080	10661·757
29	·5635602	·8571164	36606·67	719641·89	78	·2746755	3·9434706	1882·242	8779·515
30	·5463107	·8353485	35181·21	684460·68	79	·2116077	·8544087	1627·825	7151·690
31	·5290055	·8133499	33806·91	650653·77	80	·1437530	·7603716	1392·365	5759·325
32	·5116436	·7911091	32482·06	618171·71	81	3·0709765	·6610344	1177·543	4581·7819
33	·4942288	·7686132	31205·33	586966·38	82	2·9927879	·5560915	983·5307	3598·2512
34	·4767494	·7458491	29974·33	556992·05	83	·9090680	.4451624	811·0881	2787·1631
35	·4592036	·7228022	28787·48	528204·57	84	·8194651	·3278252	659·8802	2127·2829
36	·4415816	·6994575	27642·96	500561·61	85	·7236160	·2036008	529·1954	1598·0875
37	·4238849	·6757991	26539·02	474022·59	86	·6207659	3·0720593	417·6052	1180·4823
38	·4060970	·6518096	25473·99	448548·60	87	·5105274	2·9327251	323·9869	856·4954
39	·3882070	·6274709	24445·95	424102·65	88	·3910697	·7856281	246·0762	610·4192
40	·3701951	·6027649	23452·83	400649·82	89	·2641975	·6311207	182·7374	427·6818
41	·3520634	·5776710	22493·83	378155·99	90	2·1281772	·4673868	134·3313	293·35054
42	·3337850	·5521681	21566·77	356589·22	91	1·9828759	·2949440	96·13375	197·21679
43	·3153548	·5262339	20670·68	335918·54	92	·8280010	2·1136731	67·29773	129·91906
44	·2967503	·4998447	19803·88	316114·66	93	·6628670	1·9238008	46·01156	83·90750
45	·2779591	·4729748	18965·27	297149·39	94	·4879061	·7255293	30·75432	53·15318
46	·2589685	·4455972	18153·84	278995·55	95	·3029079	·5193884	20·08667	33·06651
47	·2397710	·4176821	17368·85	261626·70	96	1·1080705	·3062345	12·82539	20·241116
48	·2203462	·3891972	16609·11	245017·59	97	0·9040083	1·0872197	8·016932	12·224184
49	·2006785	·3601083	15873·71	229143·88	98	·6913420	0·8639910	4·912946	7·311238
50	·1807449	·3303779	15161·59	213982·29	99	·4773028	·6344757	3·001254	4·309984
51	·1605272	·2999654	14471·95	199510·34	100	·2603455	·3959961	1·821149	2·488835
52	·1399723	·2688292	13802·96	185707·38	101	0·0256596	0·1547194	1·060864	1·4279709
53	·1190573	·2369235	13153·99	172553·39	102	9·8045465	9·8978324	·6375974	·7903735
54	·0977362	·2042003	12523·80	160029·59	103	·5808559	·6121840	·3809394	·4094341
55	·0759663	·1706081	11911·50	148118·09	104	·3639986	9·2509774	·2312055	·1782286
56	·0537085	·1360915	11316·40	136801·69	105	9·1292127	8·6392542	·1346519	·0435767
57	·0309418	·1005884	10738·46	126063·23	106	8·6392542	...	·0435767	·0000000
58	4·0075817	5·0640352	10176·11	115887·13					

Table 3.

England and Wales.—Whole Population.—Single Lives.—Males.—Three and a Half per Cent.

Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x	Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x
10	4·8505965	6·1737697	70891·88	1492003·00	59	3·8595370	4·8836423	7236·641	76496·626
11	·8322073	·1535252	67952·79	1424050·21	60	·8327843	·8431849	6804·314	69692·312
12	·8142093	·1331734	65194·25	1358855·96	61	·8052930	·8014406	6386·942	63305·370
13	·7965094	·1126937	62590·64	1296265·32	62	·7769467	·7583212	5983·381	57321·989
14	·7790060	·0920705	60118·20	1236147·12	63	·7476937	·7137287	5593·630	51728·359
15	·7615817	·0712903	57753·95	1178393·17	64	·7174006	·6675613	5216·757	46511·602
16	·7441114	·0503473	55476·80	1122916·37	65	·6860001	·6197059	4852·886	41658·716
17	·7264629	·0292414	53267·57	1069648·80	66	·6533437	·5700448	4501·359	37157·357
18	·7086236	6·0079717	51123·85	1018524·95	67	·6193825	·5184428	4162·771	32994·586
19	·6905944	5·9865389	49044·96	969479·99	68	·5839502	·4647570	3836·633	29157·953
20	·6723900	·9649420	47031·63	922448·36	69	·5469752	·4088241	3523·507	25634·446
21	·6540299	·9431796	45084·77	877363·59	70	·5082526	·3504709	3222·943	22411·503
22	·6355342	·9160108	43205·02	834158·57	71	·4676634	·2895024	2935·374	19476·129
23	·6169094	·8991457	41391·33	792767·24	72	·4249429	·2257162	2660·375	16815·754
24	·5981474	·8768676	39641·25	753125·99	73	·3799414	·1588821	2398·518	14417·236
25	·5792450	·8544112	37952·91	715173·08	74	·3323390	·0887642	2149·508	12267·728
26	·5602181	·8317719	36326·04	678847·04	75	·2819931	4·0150872	1914·226	10353·502
27	·5410883	·8089442	34760·68	644086·36	76	·2284649	3·9375806	1692·251	8661·251
28	·5218678	·7859208	33255·83	610830·53	77	·1715228	·8559397	1484·304	7176·947
29	·5025696	·7626937	31810·43	579020·10	78	·1106317	·7698810	1290·125	5886·822
30	·4832169	·7392526	30424·04	548596·06	79	3·0454609	·6791071	1110·352	4776·4702
31	·4638087	·7155870	29094·35	519501·71	80	2·9755030	·5833479	945·1549	3831·3153
32	·4443436	·6916848	27819·13	491682·58	81	·9006234	·4822798	795·4692	3035·8461
33	·4248257	·6675333	26596·58	465086·00	82	·8203316	·3755993	661·1981	2374·6480
34	·4052431	·6431190	25423·95	439662·05	83	·7345087	·2629284	542·6361	1832·0119
35	·3855943	·6184275	24299·33	415362·72	84	·6428026	·1438482	439·3419	1392·6700
36	·3658721	·5934435	23220·53	392142·19	85	·5448504	3·0178840	350·6310	1042·0390
37	·3460693	·5681509	22185·50	369956·69	86	·4398971	2·8846149	275·3577	766·6813
38	·3261782	·5425322	21192·30	348764·39	87	·3275555	·7435765	212·5962	554·0851
39	·3061852	·5165692	20238·82	328525·57	88	·2059947	·5948265	160·6922	393·3929
40	·2860701	·4902434	19322·80	309202·77	89	2·0770194	·4377328	119·4041	273·98877
41	·2658353	·4635341	18443·16	290759·61	90	1·9388959	·2721052	86·87522	187·11355
42	·2454537	·4364203	17597·61	273162·00	91	·7914905	2·0977503	61·87148	125·24207
43	·2249205	·4088790	16784·97	256377·03	92	·6345125	1·9145472	43·10350	82·13857
44	·2042128	·3808868	16003·42	240373·61	93	·4672754	·7227248	29·32752	52·81105
45	·1833185	·3524177	15251·71	225121·90	94	·2902113	·5224848	19·50794	33·30311
46	·1622247	·3234445	14528·63	210593·27	95	1·1031100	·3143598	12·67973	20·623376
47	·1409242	·2939368	13833·25	196760·02	96	0·9061695	1·0992126	8·056929	12·566447
48	·1193962	·2638627	13164·25	183595·77	97	·7000042	0·8782071	5·011921	7·554526
49	·0976254	·2331870	12520·61	171075·16	98	·4852347	·6530151	3·056572	4·497954
50	·0755886	·2018721	11901·14	159174·02	99	·2690924	·4215636	1·858199	2·639755
51	·0532679	·1698775	11304·93	147869 09	100	0·0500330	0·1811719	1·122104	1·5176511
52	·0306098	·1371603	10730·25	137138·84	101	9·8132440	9·9380972	·6504951	·8671560
53	4·0075917	·1036755	10176·34	126962·499	102	·5900277	·6795061	·3890700	·4780860
54	3·9841674	·0693739	9642·006	117320·493	103	·3642340	·3922658	·2313311	·2467549
55	·9602945	5·0342039	9126·295	108194·198	104	9·1451736	9·0296361	·1396927	·1070622
56	·9359335	4·9981099	8628·464	99565·734	105	8·9083846	8·4163229	·0809813	·0260809
57	·9110637	·9610293	8148·236	91417·498	106	8·4163229	...	·0260809	·0000000
58	3·8856004	4·9228981	7684·231	83733·267					

Table 4.

England and Wales.—Whole Population.—Single Lives.—Males.—Four per Cent.

Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x	Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x
10	4·8296666	6·1147133	67566·41	1302307·37	59	3·7360506	4·7420372	5445·661	55212·475
11	·8091844	·0926727	64444·28	1237863·09	60	·7072049	·6999831	5095·712	50116·763
12	·7890934	·0705299	61530·92	1176332·17	61	·6776206	·6566406	4760·150	45356·613
13	·7693005	·0482643	58789·60	1117542·57	62	·6471814	·6119215	4437·939	40918·674
14	·7497041	·0258573	56195·83	1061346·74	63	·6158353	·5657269	4128·909	36789·765
15	·7301868	6·0032968	53726·28	1007620·46	64	·5834493	·5179554	3832·210	32957·555
16	·7106236	5·9805763	51359·83	956260·63	65	·5499557	·4684918	3547·772	29409·783
17	·6908820	·9576950	49077·46	907183·17	66	·5152064	·4172195	3274·963	26134·820
18	·6709498	·9346535	46875·92	860307·25	67	·4791522	·3640011	3014·062	23120·758
19	·6508275	·9114526	44753·55	815553·70	68	·4416269	·3086964	2764·565	20356·193
20	·6305302	·8880916	42710·06	772843·64	69	·4025589	·2511382	2526·731	17829·462
21	·6100771	·8645694	40745·26	732098·38	70	·3617433	·1911541	2300·081	15529·381
22	·5894884	·8408834	38858·72	693239·66	71	·3190611	·1285479	2084·784	13444·597
23	·5687706	·8170304	37048·50	656191·16	72	·2742477	4·0631160	1880·389	11564·208
24	·5479157	·7930075	35311·46	620879·70	73	·2271531	3·9946277	1687·148	9877·060
25	·5269202	·7688117	33644·98	587234·72	74	·1774578	·9228466	1504·727	8372·333
26	·5058004	·7444391	32047·96	555186·76	75	·1250189	·8474958	1333·580	7038·753
27	·4845775	·7198838	30519·51	524667·25	76	·0693977	·7683039	1173·269	5865·484
28	·4632641	·6951396	29057·89	495609·36	77	3·0103626	·6849652	1024·148	4841·336
29	·4418729	·6701976	27661·32	467948·04	78	2·9473785	·5971958	8858·873	3955·4492
30	·4204272	·6450482	26328·57	441619·47	79	·8801147	·5046980	758·7779	3196·6713
31	·3989260	·6196804	25056·82	416562·65	80	·8080639	·4072020	642·7823	2553·8890
32	·3773679	·5940822	23843·38	392719·27	81	·7310912	·3043841	538·3828	2015·5062
33	·3557570	·5682408	22685·95	370033·32	82	·6487065	·1959415	445·3552	1570·1510
34	·3340815	·5421427	21581·50	348451·82	83	·5607905	3·0814956	363·7395	1206·4115
35	·3123396	·5157734	20527·67	327924·15	84	·4669915	2·9606266	293·0836	913·3279
36	·2905245	·4891173	19522·01	308402·14	85	·3669463	·8328584	232·7803	680·5476
37	·2686286	·4621583	18562·16	289839·98	86	·2599000	·6977692	181·9282	498·6194
38	·2466446	·4348786	17645·93	272194·05	87	·1454654	·5548922	139·7865	358·8329
39	·2245586	·4072601	16770·99	255423·06	88	2·0218116	·4042901	105·1506	253·6823
40	·2023505	·3792840	15934·94	239488·12	89	1·8907433	·2453266	77·75768	175·92460
41	·1800227	·3509294	15136·40	224351·72	90	·7505269	2·0778118	56·30240	119·62220
42	·1575481	·3221752	14373·03	209978·69	91	·6010294	1·9015510	39·90519	79·71701
43	·1349219	·2929985	13643·38	196335·31	92	·4419585	·7164227	27·66677	52·05024
44	·1121213	·2633750	12945·57	183389·74	93	·2726283	·5226572	18·73391	33·31633
45	·0891339	·2332794	12278·18	171111·56	94	1·0934713	·3204560	12·40142	20·91491
46	·0659472	·2026836	11639·84	159471·72	95	0 9042770	1·1103543	8·021896	12·893010
47	·0425537	·1715577	11029·45	148442·27	96	·7052435	0·8932212	5·072751	7·820259
48	4·0189327	·1398686	10445·58	137996·69	97	·4969852	·6702328	3·140401	4·679858
49	3·9950689	·1075816	9887·098	128109·589	98	·2801227	·4430844	1·905999	2·773859
50	·9709391	·0746584	9352·746	118756·843	99	0·0618874	0·2097039	1·153154	1·620705
51	·9465254	·0410587	8841·489	109915·354	100	9·8407341	9·9674093	·6930014	·9277037
52	·9217744	5·0067385	8351·690	101563·664	101	·6018520	·7225479	·3998084	·5278953
53	·8966632	4·9716524	7882·486	93681·178	102	·3765428	·4622693	·2379812	·2899141
54	·8711460	·9357515	7432·689	86248·489	103	9·1486561	9·1734680	·1408174	·1490967
55	·8451800	·8989838	7001·321	79247·168	104	8·9275027	8·8093637	·0846258	·0644709
56	·8187261	·8612929	6587·583	72659·585	105	·6886207	8·1944660	·0488226	·0156483
57	·7917633	·8226162	6191·036	66468·549	106	8·1944660	...	·0156483	·0000000
58	3·7642070	4·7828891	5810·413	60658·136					

TABLE 5.

England and Wales.—Whole Population.—Single Lives.—Males.—Four-and-a-Half per Cent.

Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x	Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x
10	4·8088371	6·0580967	6439·277	1143133·15	59	3·6131565	4·6015224	4103·520	39950·513
11	·7862719	·0342277	61132·47	1082600·68	60	·5822279	·5578567	3821·448	36129·065
12	·7640980	6·0102622	58089·55	1023911·13	61	·5505606	·5129025	3552·717	32576·348
13	·7422221	5·9861702	55253·99	968657·14	62	·5180384	·4665702	3296·413	29279·935
14	·7205428	·9619480	52546·38	916110·76	63	·4846094	·4187612	3052·175	26227·760
15	·6989425	·9375750	49996·84	866113·92	64	·4501404	·3693728	2819·295	23408·465
16	·6772964	·9130441	47565·97	818547·95	65	·4145639	·3182911	2597·550	20810·915
17	·6554719	·8883554	45234·72	773313·23	66	·3777316	·2653976	2386·336	18424·579
18	·6334567	·8635098	42998·83	730314·40	67	·3395944	·2105555	2185·719	16238·860
19	·6112515	·8385084	40855·59	689458·81	68	·2999862	·1536216	1995·199	14243·661
20	·5888712	·8133510	38803·53	650655·28	69	·2588353	·0944303	1814·827	12428·834
21	·5663351	·7880368	36841·31	613813·97	70	·2159368	4·0328080	1644·133	10784·701
22	·5436635	·7625634	34967·41	578846 56	71	·1711716	3·9685576	1483·104	9301·597
23	·5208627	·7369282	33178·96	545667·60	72	·1242752	·9014747	1331·298	7970·299
24	·4979248	·7111284	31472·04	514195·56	73	·0750977	·8313277	1188·770	6781·529
25	·4748464	·6851614	29843·26	484352·30	74	3·0233194	·7578792	1055·163	5726·366
26	·4516436	·6590236	28290·69	456061·61	75	2·9687075	·6808513	930·6738	4795·6924
27	·4283379	·6327094	26812·54	429249·07	76	·9110934	·5999718	814·8795	3980·8129
28	·4049415	·6062124	25406·31	403842·76	77	·8499753	·5149336	707·9055	3272·9074
29	·3814673	·5795244	24069·51	379773·25	78	·7849083	·4254525	609 4082	2663·4992
30	·3579387	·5526354	22800·20	356973·05	79	·7155616	·3312304	519·4713	2144·0279
31	·3343545	·5255346	21595·07	335377·98	80	·6414278	·2319982	437·9533	1706·0746
32	·3107135	·4982099	20450·95	314927·03	81	·5623722	·1274314	365·0666	1341·0080
33	·2870196	·4706485	19365·09	295561·94	82	·4779045	3·0172282	300·5415	1040·4665
34	·2632611	·4428368	18334·17	277227 77	83	·3879056	2·9010094	244·2899	796·1766
35	·2394363	·4147600	17355·47	259872·30	84	·2920236	·7783550	195·8951	600·2815
36	·2155382	·3864028	16426·24	243446 06	85	·1898954	·6487865	154·8443	445·4372
37	·1915595	·3577485	15543·88	227902·18	86	2·0807662	·5118814	120·4387	324·9985
38	·1674925	·3287794	14705·93	213196·25	87	1·9642486	·3671710	92·09766	232·90083
39	·1433235	·2994777	13909·85	199286·40	88	·8385119	·2147231	68·94645	163·95438
40	·1190325	·2698239	13153·24	186133·16	89	·7053607	2·0538967	50·74126	113·21312
41	·0946217	·2397970	12434·31	173698·85	90	·5630613	1·8845036	36·56464	76·64848
42	·0700642	·2093759	11750·71	161948·14	91	·4114809	·7063484	25 79175	50·85673
43	·0453550	·1785376	11100·82	150847·32	92	·2503270	·5193099	17·79619	33·06054
44	4·0204714	·1472580	10482·66	140364·66	93	1·0789139	·3236217	11·99262	21·067921
45	3·9954011	·1155107	9894·665	130469·982	94	0·8976739	1·1194292	7·902671	13·165250
46	·9701314	·0832683	9335·367	121134·615	95	·7063966	0·9073583	5·086237	8·079013
47	·9446549	·0505001	8803·490	112331 125	96	·5052802	·6882467	3·200959	4·878051
48	·9189511	5·0171736	8297·573	104033·552	97	·2949389	·4632820	1·972145	2·905909
49	·8980043	4·9832527	7816·355	96217·197	98	0·0759935	0·2341843	1·191224	1·7146849
50	·8667916	·9486997	7358·539	88858·658	99	9·8556752	9·9988812	·7172577	·9974272
51	·8402949	·9134730	6923·009	81935·649	100	·6324390	·7546887	·4289819	·5684453
52	·8134609	·8775294	6508·201	75427·448	101	·3914740	·5080446	·2463054	·3221399
53	·7862668	·8408227	6113·175	69314·273	102	9·1640818	9·2460823	·1459089	·1762310
54	·7586666	·8033035	5736·758	63577·515	103	8·9341121	8·9557238	·0859235	·0903075
55	·7306177	·7649197	5377·961	58199·554	104	·7108758	8·5901483	·0513897	·0389178
56	·7020808	·7256145	5035·943	53163·611	105	8·4699108	7·9736732	·0295060	·0094118
57	·6730350	·6853248	4710·153	48453·458	106	7 9736732	...	·0094118	·0000000
58	3·6433959	4·6439856	4399·425	44051·033					

Table 6.

England and Wales.—Whole Population.—Single Lives.—Males.—Five per Cent.

Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x	Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x
10	4·7881070	6·0037014	61391·32	1008559·17	59	3·4908490	4·4620736	3096·343	28978·349
11	·7634688	5·9779767	58005·45	950553·72	60	·4578474	·4167831	2869·772	26108·577
12	·7392219	·9521616	54855·72	895698·00	61	·4241071	·3702044	2655·260	23453·317
13	·7152730	·9262320	51912·63	843785·37	62	·3895119	·3222475	2451·952	21001·365
14	·6915207	·9001681	49149·68	794635·69	63	·3540099	·2728131	2259·487	18741·878
15	·6678474	·8739558	46542·25	748093·44	64	·3174679	·2217983	2077·150	16664·728
16	·6441282	·8475881	44068·50	704024·94	65	·2798184	·1690882	1904·664	14760·064
17	·6202307	·8210652	41709·09	662315·85	66	·2409131	·1145646	1741·458	13018·606
18	·5961425	·7943884	39458·68	622857·17	67	·2007029	4·0580899	1587·460	11431·146
19	·5718643	·7675594	37313·36	585543·81	68	·1590217	3·9995202	1442·188	9988·958
20	·5474110	·7405785	35270·45	550273·36	69	·1157977	·9386895	1305·563	8683·395
21	·5228019	·7134451	33327·44	516945 92	70	·0708262	·8754236	1177·135	7506·260
22	·4980573	·6861574	31481·64	485464·28	71	3·0239880	·8095241	1056·788	6449·472
23	·4731835	·6587125	29729·22	455735·06	72	2·9750186	·7407866	944·1013	5505·3708
24	·4481726	·6311084	28065·49	427669·57	73	·9237681	·6689782	839·0118	4666·3590
25	·4230212	·6033428	26486·29	401183·28	74	·8699168	·5938608	741·1682	3925·1908
26	·3977454	·5754124	24988·80	376194·48	75	·8133219	·5151555	650·6118	3274·5790
27	·3723666	·5473119	23570·38	352624·10	76	·7535448	·4325891	566·9500	2707 6290
28	·3468972	·5190352	22227·84	330396·26	77	·6903537	·3458540	490·1779	2217·4511
29	·3213500	·4905740	20958·01	309438·25	78	·6232137	·2546653	419·9656	1797·4855
30	·2957484	·4619185	19758·25	289680·00	79	·5517939	·1587255	356·2820	1441·2035
31	·2700912	·4330577	18624·78	271055·22	80	·4755871	3·0577655	298·9421	1142·2614
32	·2443772	·4039800	17554·05	253501·17	81	·3944585	2·9514625	248·0039	894·2575
33	·2186103	·3746719	16542·85	236958·32	82	·3079178	·8395159	203·1973	691·0602
34	·1927788	·3451202	15587·59	221370·73	83	·2158459	·7215479	164·3788	526·6814
35	·1668810	·3153100	14685·23	206685·50	84	·1178909	·5971402	131·1871	395·4943
36	·1409099	·2852257	13832·80	192852·70	85	2·0136897	·4658182	103·2023	292·2928
37	·1148581	·2548508	13027·41	179825·29	86	1·9024875	·3269336	79·88909	212·29204
38	·0887181	·2241675	12266·43	167558·86	87	·7838969	·1803926	60·79907	151·49297
39	·0624761	·1931572	11547·18	156011·68	88	·6560872	2·0261004	45 29885	106·19412
40	·0361121	·1618009	10867·06	145144·62	89	·5208629	1·-634113	33·17898	73·01514
41	4·0096283	·1300776	10224·18	134920·44	90	·3764905	·6921404	23·79527	49·21987
42	3·9829978	·0979663	9616·074	125304·362	91	·2228371	·5120869	16·70464	32·51523
43	·9562156	·0654430	9040·982	116263·380	92	1·0596102	·3231281	11·47124	21·04399
44	·9292590	5 0324838	8496·870	107766·510	93	0·8861241	1·1254969	7·693503	13·350482
45	·9021157	4·9990629	7982·073	99784·437	94	·7028111	0·9193952	5·044419	8·306063
46	·8747730	·9651519	7495·024	92289·413	95	·5094608	·7053625	3·231922	5·074141
47	·8472235	·9307203	7034·343	85255·070	96	·3062714	·4842795	2·024284	3·049857
48	·8194466	·8957350	6598·521	78656·549	97	0·0938571	·2573456	1·241244	1·808613
49	·7914268	·8601602	6186·241	72470·308	98	9·8728387	0·0263052	·7461716	1·0624416
50	·7631411	·8239575	5796·170	66674·138	99	·6504474	9·7890852	·4471440	·6152976
51	·7345714	·7870848	5427·145	61246·993	100	·4251381	·5430002	·2661571	·3491405
52	·7056644	·7494992	5077·669	56169·324	101	9·1821001	·2945780	·1520898	·1970507
53	·6763973	·7111537	4746·760	51422·564	102	8·9526349	9·0309363	·0896675	·1073832
54	·6467242	·6719988	4433·270	46989·294	103	·7205922	8·7390245	·0525524	·0548308
55	·6166023	·6319821	4136·207	42853·087	104	·4952829	8·3719902	·0312812	·0235496
56	·5859924	·5910465	3854·716	38998·371	105	8·2522449	7·7539343	·0178750	·0056746
57	·5548736	·5491284	3588 175	35410·196	106	7·7539343	...	·0056746	·0000000
58	3·5231614	4·5061624	3335·504	32074·692					

Table 7.

England and Wales.—Whole Population.—Single Lives.—Males.—Six per Cent.

Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x	Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x
10	4·7469413	5·9009124	55839·47	795998·70	59	3·2479715	4·1862721	1769·993	15355·789
11	·7181866	·8714192	52262·07	743736·63	60	·2108534	·1376956	1625·000	13730·789
12	·6898231	·8418466	48957·94	694778·69	61	·1729965	·0878325	1489·349	12241·440
13	·6617577	·8121674	45894·19	648884·50	62	·1342848	4·0365930	1362·338	10879·102
14	·6338888	·7823599	43041·64	605842·86	63	·0946662	3·9838763	1243·558	9635·544
15	·6060989	·7524089	40373·73	565469·13	64	·0540076	·9295785	1132·420	8503·124
16	·5782632	·7223063	37867·20	527601·93	65	3·0122416	·8735841	1028·589	7474·535
17	·5502491	·6920536	35501·70	492100·23	66	2·9692197	·8157739	931·5803	6542·9548
18	·5220443	·6616527	33269·35	458830·88	67	·9248929	·7560095	841·1877	5701·7671
19	·4936496	·6311058	31163·74	427667·14	68	·8790952	·6941459	756·9988	4944·7683
20	·4650797	·6004146	29179·62	398487·52	69	·8317546	·6300156	678·8200	4265·9483
21	·4363540	·5695793	27312·03	371175·49	70	·7826665	·5634428	606·2706	3659 6777
22	·4074929	·5385983	25556·00	345619·49	71	·7317118	·4942277	539·1527	3120·5250
23	·3785025	·5074697	23905·76	321713·73	72	·6786258	·4221641	477·1180	2643·4070
24	·3493750	·4761919	22355·02	299358·71	73	·6232587	·3470166	420·0116	2223·3954
25	·3201071	·4447637	20898·11	278460·60	74	·5652909	·2685468	367·5284	1855·8670
26	·2907147	·4131824	19530·56	258930·04	75	·5045794	·1864724	319·5799	1536·2871
27	·2612103	·3814434	18248·17	240681·87	76	·4406857	·1005184	275·8581	1260·4290
28	·2316334	·3495406	17046·43	223635·44	77	·3733781	3·0103746	236·2535	1024·1755
29	·2019696	·3174668	15920·98	207714·46	78	·3021215	2·9157544	200·5033	823·6722
30	·1722514	·2852117	14867·96	192846·50	79	·2265851	·8163592	168·4943	655·1779
31	·1424777	·2527650	13882·82	178963·68	80	·1462618	·7119209	140·0431	515·1348
32	·1126171	·2201143	12961·25	166002·43	81	2·0610166	·6021147	115·0844	400·0504
33	·0827636	·1872471	12099·39	153903·04	82	1·9703593	·4866398	93·40267	306·64770
34	·0528156	·1541497	11293·17	142609·87	83	·8741709	·3651159	74·84640	231·80130
35	4·0228012	·1208068	10539·04	132070·83	84	·7720993	·2371203	59·16969	172·63161
36	3·9927136	·0872034	9833·624	122237·203	85	·6637815	2·1021698	46·10855	126·52306
37	·9625452	·0533224	9173·714	113063·489	86	·5484628	1·9598381	35·35598	91·16708
38	·9322886	5·0191458	8556·351	104507·138	87	·4257556	·8096506	26·65358	64·51350
39	·9019301	4·9846554	7978·663	96528·475	88	·2938294	·6516880	19·67119	44·84231
40	·8714495	·9498318	7437·885	89090·590	89	·1544885	·4852981	14·27212	30·57019
41	·8408491	·9146538	6931·855	82158·735	90	1·0059995	·3102915	10·13910	20·43109
42	·8101021	·8790997	6458·060	75700·675	91	0·8482296	1·1264701	7·050658	13·380429
43	·7792033	·8431462	6014·553	69686·122	92	·6808861	0·9337076	4·796077	8·584352
44	·7481301	·8067691	5599·253	64086·869	93	·5032834	·7322390	3·186276	5·398076
45	·7168703	·7699419	5210·391	58876·478	94	·3158539	·5222656	2·069445	3·328631
46	·6854110	·7326364	4846·307	54030·171	95	0·1183870	·3043313	1·313370	2·015261
47	·6537449	·6948214	4505·520	49524·651	96	9·9110810	0·0793278	·8148563	1·2004047
48	·6218515	·6564639	4186·504	45338·147	97	·6945502	9·8484770	·4949373	·7054674
49	·5897151	·6175271	3887·900	41450·247	98	·4694152	·6135708	·2947238	·4107436
50	·5573128	·5779725	3608·384	37841·863	99	·2429073	·3725330	·1749495	·2357941
51	·5246266	·5377572	3346·776	34495·087	100	9·0134815	9·1226785	·1031529	·1326412
52	·4916030	·4968378	3101·723	31393·364	101	8·7663269	8·8707128	·0583884	·0742528
53	·4582193	·4551667	2872·230	28521·134	102	·5327451	·6037234	·0340993	·0401535
54	·4244296	·4126940	2657·233	25863·901	103	·2965859	8·3087159	·0197964	·0203571
55	·3901911	·3693664	2455·789	23408·112	104	8·0671600	7·9387548	·0116724	·0086847
56	·3554646	·3251263	2267·068	21141·044	105	7·8200054	7·3175828	·0066070	·0020777
57	·3202293	·2799096	2090·400	19050·644	106	7·3175783	...	·0020777	·0000000
58	3·2844005	4·2336503	1924·862	17125·782					

Table 8.

England and Wales.—Whole Population.—Single Lives.—Males.—Seven per Cent.

Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x	Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x
10	4·7061622	5·8050606	50834·93	638352·36	59	3·0073747	3·9144555	1017·126	8212·1225
11	·6733295	·7717483	47133·47	591218·89	60	2·9661786	·8625514	925·0785	7287·0440
12	·6408882	·7383665	43740·95	547477·94	61	·9242439	·8093652	839·9316	6447·1124
13	·6087448	·7048859	40620·46	506857·48	62	·8814542	·7548060	761·1219	5685·9905
14	·5767980	·6712818	37739·67	469117·81	63	·8377577	·6987721	688·2682	4997·7223
15	·5449302	·6375381	35069·55	434048·26	64	·7930212	·6411590	620·8993	4376·8230
16	·5130166	·6036458	32584·92	401463·34	65	·7471773	·5818502	558·6982	3818·1248
17	·4809246	·5696074	30263·88	371199·46	66	·7000775	·5207255	501·2768	3316·8480
18	·4486419	·5354248	28095·83	343103·63	67	·6516728	·4576459	448·4074	2868·4406
19	·4161692	·5011030	26071·69	317031·94	68	·6017971	·3924653	399·7579	2468·6827
20	·3835214	·4666426	24183·63	292848·31	69	·5503786	·3250146	355·1229	2113·5598
21	·3507179	·4320454	22424·25	270424·06	70	·4972127	·2551169	314·2047	1799·3551
22	·3177788	·3973102	20786·37	249637·69	71	·4421800	·1825704	276·8089	1522·5462
23	·2847105	·3624359	19262·40	230375·29	72	·3850161	·1071678	242·6700	1279·8762
24	·2515051	·3274218	17844·53	212530·76	73	·3255711	3·0286725	211·6270	1068·2492
25	·2181593	·2922674	16525·68	196005·08	74	·2635254	2·9468431	183·4533	884·7959
26	·1846890	·2569707	15299·92	180705·16	75	·1987360	·8613953	158·0287	726·7672
27	·1511157	·2215277	14161·71	166543·45	76	·1307644	·7720526	135·1340	591·6332
28	·1174518	·1859329	13105·44	153438·01	77	2·0593788	·6785019	114·6513	476·98189
29	·0837101	·1501797	12125·79	141312·22	78	1·9840443	·5804565	96·39273	380·58916
30	·0499141	·1142581	11217·97	130094·25	79	·9044301	·4776159	80·24724	300·58916
31	4·0160624	·0781576	10376·78	119717·466	80	·8200288	·3697134	66·07373	234·26819
32	3·9821539	·0418666	9597·407	110120·059	81	·7307057	·2564235	53·79052	180·47767
33	·9481925	5·0053719	8875·493	101244·566	82	·6359705	·1374462	43·24842	137·22925
34	·9141666	4·9686599	8206·663	93037·903	83	·5357042	2·0124019	34·33240	102·89685
35	·8800743	·9317164	7587·074	85450·829	84	·4295547	1·8808655	26·88776	76·00909
36	·8459087	·8945252	7013·078	78437·751	85	·3171590	·7423513	20·75668	55·25241
37	·8116624	·8570697	6481·304	71956·447	86	·1977623	·5964313	15·76748	39·48493
38	·7773279	·8193321	5988·636	65967·811	87	1·0709772	·4426285	11·77544	27·709491
39	·7428915	·7812935	5532·119	60435·692	88	0·9349731	·2810354	8·609405	19·100086
40	·7083330	·7429350	5108·966	55326·726	89	·7915543	1·1109945	6·188057	12·912029
41	·6736547	·7042351	4716·879	50609·847	90	·6389874	0·9323233	4·354993	8·557036
42	·6388297	·6651723	4353·412	46256·435	91	·4771395	·7448334	3·000126	5·556910
43	·6038531	·6257227	4016·550	42239·885	92	·3057182	·5484144	2·021707	3·535204
44	·5687020	·5858624	3704·265	38535·620	93	0·1240376	·3433364	1·330569	2·2046335
45	·5333642	·5455647	3414·792	35120·828	94	9·9325301	0·1298580	·8561110	1·3485225
46	·4978270	·5018015	3146·494	31974·334	95	·7309853	9·9086303	·5382516	·8102709
47	·4620830	·4635413	2897·897	29076·437	96	·5196014	·6807375	·3308274	·4794435
48	·4261117	·4217501	2667·545	26408·892	97	·2989927	·4477462	·1990640	·2803795
49	·3898974	·3793918	2454·129	23954·763	98	9·0697798	9·2120525	·1174302	·1629493
50	·3534172	·3364269	2256·405	21698·358	99	8·8391940	8·9726402	·0690548	·0938945
51	·3166530	·2928119	2073·256	19625·102	100	·6056902	·7063653	·0430358	·0508587
52	·2795516	·2485032	1903·494	17721·608	101	·3544578	·4508724	·0226182	·0282405
53	·2420900	·2035523	1746·184	15975·424	102	8·1167981	8·1805502	·0130857	·0151548
54	·2042223	·1576094	1600·378	14375·046	103	7·8765609	7·8824619	·0075259	·0076289
55	·1659059	·1109203	1465·230	12909·816	104	·6430571	7·5095923	·0043960	·0032329
56	·1271015	·0633271	1339·990	11569·826	105	7·3918246	6·8853196	·0024650	·0007679
57	·0877883	4·0147646	1224·019	10345·807	106	6·8853196	...	·0007679	·0000000
58	3·0478816	3·9651664	1116·559	9229·248					

Table 9.

England and Wales.—Whole Population.—Single Lives.—Males.—Eight per Cent.

Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x	Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x
10	4·6657624	5·7150797	46319·34	518895·25	59	2·7690160	3·6464515	587·5110	4430·4877
11	·6288898	·6779228	42549·04	476346·21	60	·7237800	·5911863	529·3952	3901·0925
12	·5924084	·6407053	39120·90	437225·31	61	·6778052	·5346448	476·2173	3424·8752
13	·5562251	·6033953	35993·58	401231·73	62	·6309756	·4767355	427·5389	2997·3363
14	·5202383	·5659663	33131·29	368100·44	63	·5832391	·4173556	383·0356	2614·3007
15	·4843306	·5284002	30502·16	337598·28	64	·5344626	·3564001	342·3439	2271·9568
16	·4483769	·4906881	28078·69	309519·59	65	·4845787	·2937516	305·1959	1966·7609
17	·4122450	·4528324	25837·18	283682·41	66	·4334389	·2292896	271·2932	1695·4677
18	·3759223	·4148369	23764·15	259918·26	67	·3809943	·1628734	240·4331	1455·0346
19	·3394096	·3767054	21847·90	238070·36	68	·3270786	·0943565	212·3629	1242·6717
20	·3027219	·3384412	20078·07	217992·29	69	·2716202	3·0235681	186·9047	1055·7670
21	·2658783	·3000458	18444·99	199547·30	70	·2144142	2·9503304	163·8379	891·9291
22	·2288993	·2615194	16939·45	182607·85	71	·1553416	·8744396	143·0018	748·9272
23	·1917910	·2228613	15552·17	167055·68	72	·0941377	·7956872	124·2047	624·7226
24	·1545457	·1840713	14274·00	152781·68	73	2·0306527	·7138344	107·3131	517·4095
25	·1171598	·1451501	13096·63	139685·05	74	1·9645670	·6286385	92·16520	425·24432
26	·0796496	·1060960	12012·95	127672·10	75	·8957376	·5398127	78·65703	346·58729
27	·0420363	·0669064	11016·31	116655·79	76	·8237261	·4470784	66·63863	279·94866
28	4·0043324	5·0275759	10100·26	106555·53	77	·7483005	·3501205	56·01450	223·93416
29	3·9665508	4·9880985	9258·717	97296·812	78	·6689261	·2486504	46·65800	177·27616
30	·9287147	·9484648	8486·228	88810·584	79	·5852718	·1423673	38·48326	138·79290
31	·8908231	·9086640	7777·197	81033·387	80	·4968306	2·0310043	31·39284	107·40006
32	·8528746	·8686851	7126·472	73906·915	81	·4034675	1·9142350	25·32052	82·07954
33	·8148733	·8285150	6529·400	67377·515	82	·3046924	·7917620	20·16937	61·91017
34	·7768073	·7881405	5981·462	61396·053	83	·2003860	·6632026	15·86303	46·04714
35	·7386751	·7475468	5478·669	55917·384	84	1·0901965	·5281308	12·30825	33·73889
36	·7004695	·7067186	5017·293	50900·091	85	0·9737609	·3860560	9·413712	24 325183
37	·6621832	·6656388	4593·918	46306·173	86	·8503242	·2365484	7·084746	17·240437
38	·6238088	·6242899	4205·414	42100·759	87	·7194992	1·0791238	5·242026	11·998411
39	·5853323	·5826530	3848·861	38251·898	88	·5794550	0·9138819	3·797126	8·201285
40	·5467339	·5407092	3521·551	34730·347	89	·4319963	·7401534	2·703935	5·497350
41	·5080156	·4984368	3221·185	31509·162	90	·2753894	·5577491	1·885338	3·612012
42	·4691507	·4558148	2945·444	28563·718	91	0·1095016	·3664678	1·286772	2·325240
43	·4301340	·4128190	2692·366	25871·352	92	9·9340402	0·1661772	·8590930	1·4661465
44	·3909430	·3694258	2460·045	23411·307	93	·7483196	9·9571171	·5601697	·9059768
45	·3515652	·3256081	2246·804	21164·503	94	·5527722	·7394863	·3570855	·5488913
46	·3119880	·2813380	2051·104	19113·399	95	·3471873	·5138357	·2224270	·3264643
47	·2722041	·2365836	1871·562	17241·837	96	9·1317636	·2810768	·1354452	·1910191
48	·2321927	·1913113	1706·840	15534·997	97	8·9071148	9·0424743	·0807448	·1102743
49	·1919385	·1454839	1555·746	13979·251	98	·6738620	8·7999123	·0471913	·0630830
50	·1514183	·0990619	1417·159	12562·092	99	·4392362	·5513170	·0274939	·0355891
51	·1106142	·0520018	1290·073	11272·019	100	8·2016925	·2939876	·0159108	·0196783
52	·0694727	4·0042590	1173·472	10098·547	101	7·9464200	8·0349892	·0088393	·0108390
53	3·0279712	3·9557850	1066·525	9032·022	102	·7047203	7·7613564	·0050666	·0057724
54	2·9860635	·9065292	968·4194	8063·6028	103	·4604432	·4602060	·0028870	·0028854
55	·9437071	·8564373	878·4298	7185·1730	104	7·2228994	7·0844690	·0016707	·0012147
56	·9008628	·8054509	795·9079	6389·2651	105	6·9676270	6·4570819	·0009282	·0002865
57	·8575095	·7535043	720·2935	5668·9716	106	6·4570819	...	·0002865	·0000000
58	2·8135629	3·7005306	650 9729	5017·9987					

Table 10.

England and Wales.—Whole Population.—Single Lives.—Males.—Nine per Cent.

Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x	Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x
10	4·6257350	5·6300960	42241·08	426673·79	59	2·5328542	3·3821015	341·0784	2410·4689
11	·5848596	·5890857	38446·74	388227·05	60	·4836154	·3234477	304·5197	2105·9492
12	·5443755	·5480236	35024·79	353202·26	61	·4336379	·2635260	271·4145	1834·5347
13	·5041894	·5068743	31929·30	321272·96	62	·3828055	·2022422	241·4379	1593·0968
14	·4641999	·4656095	29120 57	292152·39	63	·3310663	·1394934	214·3218	1378·7750
15	·4242894	·4242095	26563·75	265588·64	64	·2782871	·0751738	189·7960	1188·9790
16	·3843330	·3826649	24228·86	241359·78	65	·2244004	3·0091661	167·6488	1021·3302
17	·3441983	·3409784	22090·13	219269·65	66	·1692579	2 9413483	147·6583	873·6719
18	·3038729	·2991550	20131·35	199138·30	67	·1128105	·8715791	129·6614	744·0105
19	·2633575	·2571984	18338·24	180800·06	68	2·0548921	·7997110	113·4728	630·5377
20	·2226670	·2151139	16698·10	164101·96	69	1·9954309	·7255721	98·95344	531·58424
21	·1818207	·1729028	15199·19	148902·77	70	·9342222	·6489831	85·94532	445·63892
22	·1408389	·1305659	13830·53	135072·24	71	·8711468	·5697388	74·32703	371·31189
23	·0997279	·0881038	12581·37	122490·87	72	·8059482	·4876276	63·96586	307·34603
24	·0584798	·0455166	11441·41	111049·46	73	·7384526	·4024117	54·75864	252·58739
25	4·0170913	5·0028055	10401·39	100648·07	74	·6683641	·3138455	46·59766	205·98973
26	3·9755783	4·9599704	9453·188	91194·882	75	·5955320	·2216395	39·40324	166·58649
27	·9339623	·9170089	8589·390	82605·492	76	·5195177	·1255141	33·07636	133·51013
28	·8922557	·8739167	7802·894	74802·598	77	·4400894	2 0251509	27·54796	105·96217
29	·8504713	·8306878	7087·144	67715·454	78	·3567122	1·9202604	22·73590	83·22627
30	·8086325	·7873132	6436·244	61279·210	79	·2690552	·8105408	18·58040	64·64587
31	·7667381	·7437828	5844·375	55434·835	80	·1766112	·6957259	15·01797	49·62790
32	·7247869	·7000855	5306·240	50128·595	81	1·0792454	·5754897	12·00177	37·62613
33	·6827828	·6562087	4817·068	45311·527	82	0·9764675	·4495335	9·472563	28·153570
34	·6407141	·6121392	4372·341	40939·186	83	·8681584	·3174750	7·381734	20·771836
35	·5985791	·5678626	3968·068	36971·118	84	·7539662	·1788858	5·675004	15·096832
36	·5563708	·5233634	3600·567	33370·551	85	·6335278	1·0332725	4·300587	10·796245
37	·5140818	·4786251	3266·494	30104·057	86	·5060884	0·8802030	3·206922	7·589323
38	·4717046	·4336296	2962·815	27141·242	87	·3712606	·7191887	2·351043	5·238280
39	·4292254	·3883588	2686·738	24454·504	88	·2272137	·5503380	1·687383	3·550897
40	·3866242	·3427937	2435·703	22018·801	89	0·0757522	·3729738	1·190562	2·360335
41	·3439032	·2969128	2207·512	19811·289	90	9·9151426	0·1869063	·8225127	1·5378226
42	·3010355	·2506947	2000·025	17811·264	91	·7452520	9·9919326	·5562270	·9815956
43	·2580161	·2041162	1811·408	15999·856	92	·5657879	·7879182	·3679492	·6136464
44	·2148223	·1571526	1639·919	14359·937	93	·3760646	·5751035	·2377194	·3759270
45	·1714418	·1097780	1484·027	12875·910	94	9·1765144	·3536870	·1501462	·2257808
46	·1278619	·0619637	1342·338	11533·572	95	8·9669269	9·1242218	·0926674	·1331134
47	·0840752	4·0136784	1213·599	10319·973	96	·7475003	8·8876286	·0559114	·0772020
48	3·0400611	3·9648882	1096·633	9223·340	97	·5188488	·6451913	·0330255	·0441765
49	2·9958041	·9155558	990·3851	8232·9552	98	·2815932	·3988407	·0191246	·0250519
50	·9512812	·8656411	893·8841	7339·0711	99	8·0429647	8·1465001	·0110399	·0140120
51	·9064743	·8151003	806·2585	6532·8126	100	7·8014182	7·8854630	·0063302	·0076818
52	·8613301	·7638887	726·6581	5806·1545	101	·5421430	·6229700	·0034845	·0041973
53	·8158258	·7119574	654·3737	5151·7808	102	·2964406	·3460203	·0019790	·0022183
54	·7699154	·6592555	588·7289	4563·0519	103	7·0481607	7·0417873	·0011173	·0011010
55	·7235563	·6057283	529·1226	4033·9293	104	6·8066142	6·6631353	·0006406	·0004604
56	·6767092	·5513172	475·0170	3558·9123	105	·5473390	6·0327912	·0003526	·0001078
57	·6293532	·4959559	425·9447	3132·9676	106	6·0327912	...	·0001078	·0000000
58	2·5814038	3·4395769	381·4203	2751·5473					

Table 11.

England and Wales.—Whole Population.—Single Lives.—Males.—Ten per Cent.

Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x	Age x	$\lambda \cdot D_x$	$\lambda \cdot N_x$	D_x	N_x
10	4·5860731	5·5493964	38554·33	354320·62	59	2·2988492	3·1212584	198·9982	1322·0818
11	·5412316	·5045368	34772·16	319548·46	60	·2456442	3·0591954	176·0533	1146·0285
12	·4967813	·4596325	31389·27	288159·19	61	·1917005	2·9958717	155·4892	990·5393
13	·4526290	·4146461	28354·95	259804·24	62	·1369019	·9311944	137·0572	853·4821
14	·4086733	·3695473	25625·55	234178·69	63	·0811965	·8650590	120·5581	732·9240
15	·3647966	·3243145	23163·10	211015·59	64	2·0244511	·7973593	105·7916	627·1324
16	·3208740	·2789375	20935·05	190080·54	65	1·9665983	·7279763	92·59730	534·53512
17	·2767732	·2334201	18913·56	171166·98	66	·9074896	·6567885	80·81456	453·72056
18	·2324816	·1877666	17079·75	154087·23	67	·8470760	·5836532	70·31954	383·40102
19	·1880000	·1419831	15417·00	138670·23	68	·7851914	·5084227	60·98056	322·42046
20	·1433433	·0960744	13910·52	124759·71	69	·7217640	·4309231	52·69434	269·72612
21	·0985308	·0500432	12546·72	112212·99	70	·6565891	·3509742	45·35124	224·37488
22	·0535828	5·0038908	11313·13	100899·86	71	·5895476	·2683694	38·86400	185·51088
23	4·0085056	4·9576173	10197·78	90702·08	72	·5203748	·1828972	33·14170	152·36918
24	3·9632914	·9112247	9189·490	81512·594	73	·4489209	·0943149	28·11389	124·25529
25	·9179366	·8647151	8278·213	73234·381	74	·3748662	2·0023774	23·70643	100·54886
26	·8724574	·8180887	7455·167	65779·214	75	·2980679	1·9067918	19·86405	80·68481
27	·8268752	·7713438	6712·360	59066·854	76	·2180874	·8072770	16·52294	64·16187
28	·7812024	·7244770	6042·301	53024·553	77	·1346929	·7035123	13·63618	50·52569
29	·7354518	·6774828	5438·158	47586·395	78	1·0473496	·5952070	11·15192	39·37377
30	·6896468	·6303525	4893·807	42692·588	79	0·9557264	·4820580	9·030804	30·342963
31	·6437863	·5830764	4403·381	38289·207	80	·8593162	·3637999	7·232963	23·110000
32	·5978689	·5356437	3961·584	34327·623	81	·7579842	·2401059	5·727752	17·382248
33	·5518986	·4880420	3563·680	30763·943	82	·6512401	1·1106786	4·479609	12·902639
34	·5058637	·4402584	3205·263	27558·680	83	·5389648	0·9751342	3·459113	9·443526
35	·4597625	·3922787	2882·455	24676·225	84	·4208064	·8330432	2·635156	6·808370
36	·4135880	·3440878	2591·719	22084·506	85	·2964019	·6839085	1·978800	4·829570
37	·3673328	·2956689	2329·876	19754·630	86	·1649963	·5272953	1·462165	3·367405
38	·3209895	·2470047	2094·062	17660·568	87	0·0262023	·3627112	1·062191	2·305214
39	·2745441	·1980767	1881·673	15778·895	88	9·8781892	·1902737	·7554212	1·5497929
40	·2279767	·1488660	1690·350	14088·545	89	·7227615	0·0092971	·5281551	1·0216378
41	·1812895	·0993519	1518·062	12570·483	90	·5581857	9·8195923	·3615644	·6600734
42	·1344556	4·0495130	1362·873	11207·610	91	·3843290	·6209550	·2422863	·4177871
43	·0874700	3·9993258	1223·123	9984·487	92	·2008987	·4132487	·1588176	·2589695
44	3·0403101	·9487663	1097·261	8887·226	93	9·0072092	9·1967168	·1016738	·1572957
45	2·9929634	·8978084	983·9282	7903·2976	94	8·8036928	8·9715597	·0636345	·0936612
46	·9454173	·8464238	881·8958	7021·4018	95	·5901391	·7382675	0389259	·0547353
47	·8976644	·7945811	790·0679	6231·3339	96	·3667463	·4978691	·0232673	·0314680
48	·8496841	·7422460	707·4310	5523·9029	97	8·1341286	·2516261	·0136185	·0178495
49	·8014609	·6893817	633·0834	4890·8195	98	7·8929069	8·0015131	·0078146	·0100349
50	·7529718	·6359476	566·2025	4324·6170	99	·6503122	7·7454574	·0044700	·0055649
51	·7041988	·5818997	506·0563	3818·5607	100	·4047995	·4807397	·0025398	·0030251
52	·6550884	·5271932	451·9479	3366·6128	101	7·1415581	7·2147909	·0013853	·0016398
53	·6056179	·4717788	403·2904	2963·3224	102	6·8918895	6·9345994	·0007796	·0008602
54	·5557413	·4156054	359·5351	2603·7873	103	·6396434	·6273659	·0004362	·0004240
55	·5054160	·3586183	320·1960	2283·5913	104	·3941307	6·2460059	·0002478	·0001762
56	·4546028	·3007585	284·8412	1998·7501	105	6·1308894	5·6123754	·0001352	·0000410
57	·4032806	·2419589	253·0932	1745·6569	106	5·6123754	...	·0000410	·0000000
58	2·3513650	3·1821521	224·5769	1521·0800					

In pp. 532 *ante*, were given the formulæ employed in the construction of the auxiliary Tables **2** to **11** inclusive, and with but slight modifications the same are applicable to the formation of Tables on joint lives. It may, however, be convenient for many purposes to give the formulæ more in detail, by which the following Tables were formed. The rate of interest at which they are calculated, it will be observed, is seven per cent. The reason for adopting this rate is, that there are frequently contingent life interests and reversions disposed of, the market price of which is regulated by as high a rate of interest, and there being no published Tables on joint lives calculated at a higher rate than six per cent., it is believed that the following Tables will be found useful, not only in regard to such matters, but in respect to many other questions of a more general and public nature. Whenever occasion may arise for the determination of the value of contingent life interests at other rates of interest, such may be done from the following Tables by a simple mode of approximation, the formula for which is hereafter given, and its application may be safely relied on for all practical purposes.

The following, viewed in connection with the explanations already furnished in pp. 532–3 *ante*, will shew the conditions and formulæ on which the construction of the following auxiliary Tables on joint lives depends:—

Let l_x = Number living at age x in the second column of Table C (Males), pp. 5–6 *ante*, and

l_y = Number living at age y in the same Table; also

$p_{x,y}$ = Probability of the joint survivorship of two lives aged x and y for one year; and likewise

r = 0·07, seven per cent. being the rate of interest adopted in the calculation of the following Tables.

$1+r$ = 1·07, $\lambda.(1+r) = 0{\cdot}02938378$, and therefore $\frac{1}{2}\lambda.(1+r) = 0{\cdot}01469189$.

$v = \frac{1}{1+r} = {\cdot}9345794\ \ 39252$ being the present value of £.1 due one year hence, consequently

$\lambda.v = 9{\cdot}9706162$, and therefore $\lambda.\sqrt{v} = \frac{1}{2}\lambda.v = \frac{1}{2}\lambda.\left(\frac{1}{1{\cdot}07}\right) = 9{\cdot}9853081\ \ 1157$.

$v^{\frac{1}{2}} = \frac{1}{1+\frac{r}{2}} = \frac{1}{1{\cdot}035} = {\cdot}9661835\ \ 65217$ being the present value of £1 due six months hence, and therefore

$\lambda.v^{\frac{1}{2}} = \left(\frac{1}{1+\frac{r}{2}}\right) = \lambda.\left(\frac{1}{1{\cdot}035}\right) = \lambda'.1{\cdot}035 = 9{\cdot}9850596\ \ 50207$, which is not to be confounded with $\frac{1}{2}\lambda.v$, the quantity employed in the determination of the vertical series hereafter referred to.

Then in the following Auxiliary Tables will

(1) $\mathrm{D}_{x,y} = l_x.l_y\ .v^{\frac{1}{2}(x+y)} = l_{x,y}.v^{\frac{1}{2}(x+y)}$

$\mathrm{D}_{x,y+1} = l_{x,y+1}.v^{\frac{1}{2}(x+y+1)}$ and therefore

$\frac{\mathrm{D}_{x,y}}{\mathrm{D}_{x,y+1}} = \frac{1}{\sqrt{v}.p_y}$ and

(2) $\lambda.\mathrm{D}_{x,y} = \lambda.\mathrm{D}_{x,y+1} + \lambda'.\sqrt{v}.p_y = \lambda.\mathrm{D}_{x,y+1} + \lambda'.p_y + \frac{1}{2}\lambda.(1+r)$

Again $\lambda.D_{x,y+1} = \lambda.D_{x,y} + \Delta\lambda.D_{x,y}$, but

$\Delta\lambda.D_{x,y} = \lambda.p_y + \frac{1}{2}\lambda.v$, and therefore

(3) $\lambda.D_{x,y+1} = \lambda.D_{x,y} + \lambda.p_y + \frac{1}{2}\lambda.v$, or

(4) $\lambda.D_{x,y+1} = \lambda.D_{x,y} - (\lambda'.p_y + \frac{1}{2}\lambda'.v)$, and also

(5) $\lambda.D_{x,y+1} = \lambda.D_{x,y} - (\lambda'.p_y - \frac{1}{2}\lambda.v)$. On referring to page 532 *ante*, it will be seen that

$\lambda.p_{x,y} = \lambda.p_x + \lambda.p_y$, and also

$\Delta\lambda.p_{x,y} = \Delta\lambda.p_y$, x in the series being constant, therefore

$\lambda.p_{x,y+1} = \lambda.p_{x,y} + \lambda.p_y$.

In the above formulæ it is assumed in the determination of the successive differences that one of the ages, x, remains constant and the other, y, is by each step in the manipulation varied one year, and as applied to Table **13** will always vary vertically. In the practical construction of such Tables as the following there are many reasons in favour of such a mode of calculation, from its less liability to manual errors, but the same principles may be applied in the formation of Tables by a continuous series in which the result of each step in the order of differences will determine the values for a variation of one year in the age of each of the two lives, as follows, and as applied to Table **13** will vary horizontally.

(6) $\lambda.D_{(x,y)+1} = \lambda.D_{x,y} + \lambda.vp_{x,y}$, or

(7) $\lambda.D_{(x,y)+1} = \lambda.D_{x,y} + \lambda.vp_x + \lambda.p_y$ and

(8) $\lambda.D_{(x,y)+1} = \lambda.D_{x,y} + \lambda.p_x + \lambda.p_y + \lambda.v$; in like manner

(9) $\lambda.D_{x,y} = \lambda.D_{(x,y)+1} + \lambda'.vp_{x,y}$, or

(10) $\lambda.D_{x,y} = \lambda.D_{(x,y)+1} + \lambda'.vp_x + \lambda'.p_y$ and also

(11) $\lambda.D_{x,y} = \lambda.D_{(x,y)+1} + \lambda'.p_x + \lambda'.p_y + \lambda'.v$.

The preceding formulæ furnish various modes by which to construct auxiliary Tables according to the continuous method of calculation. The most convenient formula will depend on the nature and extent of the preliminary Tables which may have been prepared for facilitating the final calculation in which the value of $\lambda.D_{x,y}$ is to be determined. In the preliminary Table **12**, page 546 *ante*, will be found all the elements which enter into the above formulæ, and should no further combination of them be made there can be very little difference between the facilities in calculation offered by the expressions (2) to (5) inclusive. Each of the series of results, it will be seen, is produced by the successive additions or subtractions from the initial $\lambda.D_{x,y}$, with which the series begins, of two other quantities, but if these two quantities were combined the subsequent process of calculation would be shortened, and the values determined, by the continued addition or subtraction of only one quantity. The following preliminary Table contains the elements so combined according to the preceding methods of finding the successive values of $\lambda.D_{x,y}$.

Table 12.

Being preliminary to the construction of Tables **13** *and* **14.**

Age.	$\lambda'.p_y+\frac{1}{2}\lambda.(1+r)$ (2)	$\lambda.p_y+\frac{1}{2}\lambda.v$ (3)	$\lambda'.p_y+\frac{1}{2}\lambda'.v$ = $\lambda'.p_y-\frac{1}{2}\lambda.v$ (4) & (5)	AGE 10. $\lambda.vp_{x,y}$ (6)	$\lambda.vp_x$ or $\lambda.yp_y$ (7)	$\lambda'.vp_{x,y}$ (9)	$\lambda'.vp_x$ or $\lambda'.vp_y$ (10)
10	0·0181408	9·9818592	0·0181408	9·9637184	9·9671673	0·0362816	0·0328327
11	·0177495	·9822505	·0177495	·9641097	·9675586	·0358903	·0324414
12	·0174515	·9825485	·0174515	·9744077	·9678566	·0255923	·0321434
13	·0172549	·9827451	·0172549	·9646043	·9680532	·0353957	·0319468
14	·0171759	·9828241	·0171759	·9646833	·9681322	·0353167	·0318678
15	·0172218	·9827782	·0172218	·9646374	·9680863	·0353626	·0319137
16	·0174001	·9825999	·0174001	·9644591	·9679080	·0355409	·0320920
17	·0175908	·9824092	·0175908	·9642684	·9677173	·0357316	·0322827
18	·0177808	·9822192	·0177808	·9640784	·9675273	·0359216	·0324727
19	·0179559	·9820441	·0179559	·9639033	·9673522	·0360967	·0326478
20	·0181117	·9818883	·0181117	·9637475	·9671964	·0362525	·0328036
21	·0182472	·9817528	·0182472	·9636120	·9670609	·0363880	·0329391
22	·0183764	·9816236	·0183764	·9634828	·9669317	·0365172	·0330683
23	·0185135	·9814865	·0185135	·9633457	·9667946	·0366543	·0332054
24	·0186540	·9813460	·0186540	·9632052	·9666541	·0367048	·0333459
25	·0187784	·9812216	·0187784	·9630808	·9665297	·0369192	·0334703
26	·0188814	·9811186	·0188814	·9629778	·9664267	·0370222	·0335733
27	·0189720	·9810280	·0189720	·9628872	·9663361	·0371128	·0336639
28	·0190498	·9809502	·0190498	·9628094	·9662583	·0371906	·0337417
29	·0191042	·9808958	·0191042	·9627550	·9662039	·0372450	·0337961
30	·0191598	·9808402	·0191598	·9626994	·9661483	·0373006	·0338517
31	·0192166	·9807834	·0192166	·9626426	·9660915	·0373574	·0339085
32	·0192695	·9807305	·0192695	·9625897	·9660386	·0374103	·0339614
33	·0193341	·9806659	·0193341	·9625251	·9659740	·0374749	·0340260
34	·0194004	·9805996	·0194004	·9624588	·9659077	·0375412	·0340923
87	·1213123	·8786877	·1213123	·8605469	·8639958	·1394531	·1360042
88	·1287269	·8712731	·1287269	·8531323	·8565812	·1468677	·1434188
89	·1378750	·8621250	·1378750	·8439842	·8474331	·1560158	·1525669
90	·1471560	·8528440	·1471560	·8347032	·8381521	·1652968	·1618479
91	·1567295	·8432705	·1567295	·8251297	·8285786	·1748703	·1714214
92	·1669887	·8330113	·1669887	·8148705	·8183194	·1851295	·1816806
93	·1768156	·8231844	·1768156	·8050436	·8084925	·1949564	·1915075
94	·1868529	·8131471	·1868529	·7950063	·7984552	·2049937	·2015448
95	·1966920	·8033080	·1966920	·7851672	·7886161	·2148328	·2113839
96	·2059169	·7940831	·2059169	·7759423	·7793912	·2240577	·2206088
97	·2145210	·7854790	·2145210	·7673382	·7707871	·2326618	·2292129
98	·2158930	·7841061	·2158939	·7659653	·7694142	·2340347	·2305858
99	·2188119	·7811881	·2188119	·7630473	·7664962	·2369527	·2335038
100	·2365406	·7634594	·2365406	·7453186	·7487675	·2546814	·2512325
101	·2229678	·7770322	·2229678	·7588914	·7623403	·2411086	·2376597
102	·2255453	·7744547	·2255453	·7563139	·7597628	·2436861	·2402372
103	·2188119	·7811881	·2188119	·7630473	·7664962	·2369527	·2335038
104	·2365406	·7634594	·2365406	·7543186	·7487675	·2546814	·2512325
105	0·4918132	9·5081868	0·4918132	9·4900460	9·4934949	0·5099540	0·5065051

In columns (4) (5) of the preceding Table will be found the vertical differences by which the whole of the Tables, of which Table **13** is a specimen, were calculated. The successive values of the expression $\lambda'.p_y - \frac{1}{2}\lambda.v$ for each age, were written on a perforated slip of paper, and the initial $\lambda.D_{x,y}$, or the first at the top of each column in Table **13** having been determined from $D_{x,y} = l_{x,y}.v^{\frac{1}{2}(x+y)}$, the subsequent values of $\lambda.D_{x,y}$ in each column were produced by deducting the corresponding quantities to the given difference of age on the perforated slip. The same slip of course served for the whole range of the Table, whatever the disparity of age. For example, if from the initial $\lambda.D_{x,y} = 4{\cdot}7061622$ in the first column headed "Age" 10, Table **13**, there be, in succession, deducted the quantities in the same order given in column (4), (5) of the preceding Table **12**, the results will be found to produce the successive values in Table **13**, in that column, and the figures, in the same perforated slip, if deducted from the initial quantity in column "Age" 11, beginning also with age 11 on the slip, will, in succession, produce all the results in that column, and so, in like manner, will the results in all the other columns of Table **13** be produced. One of the advantages, independent of the reduced amount of labour of the present over the direct method of calculation followed in constructing the Tables in pp. 148 and 494 *ante* is, that if at any step of the process an error should be made, it must affect all the subsequent results, and, therefore, the correctness of any one series of the Tables may be easily tested by calculating, at an advanced stage of it, the value of $\lambda.D_{x,y}$ by the direct method. Thus, $\lambda.D_{x,y}$ in column "Age" 10, for disparity of 90 years, or for ages 10–100, is found directly from the expression $l_{x,y}.v^{\frac{1}{2}(x+y)}$.

In Table **1**	$\lambda.l_x$	$= \lambda.l_{10}$	=	5·0000000
...	$\lambda.l_y$	$= \lambda.l_{100}$	=	1·5440680
...	$\lambda.v^{\frac{1}{2}(x+y)}$	$= \lambda.v^{\frac{1}{2}(10+100)}$	$= \lambda.v^{55}$ =	8·3838922
...	$\lambda.D_{x,y}$	$= \lambda.D_{10,100}$	=	4·9279602, which

agrees with the results of Table **13**, only that the index in that Table has been reduced by 5, in order to condense the figures in the final Table **14**. It is therefore to be presumed that all the results in the same column are correct. It is possible, however, that compensating errors may have arisen, but the chances of errors which shall exactly balance each other are very remote, but, to guard against such a contingency, it is prudent to check the results by performing the direct calculation at four or five intervals throughout the column, or, what is still a better test, would be to go over the whole of the figures in the column with a second perforated slip, prepared in accordance with formula (3), as given in column (3) Table **12**, in which the expression $\lambda.p_y + \frac{1}{2}\lambda.v$ is additive, while that actually employed in the original construction of the Table was subtractive. This, carefully done, will always ensure complete accuracy.

Table 13.

(The characteristic in each of the quantities $\lambda.D_{x,y}$ has been diminished by 5.)

s	10	11	12	13	14	15	16
$y-x$	$\lambda.D_{x,y}$	$\lambda.D_{x,y}$	$\lambda.D_{x,y}$	$\lambda.D_{x,y}$	$\lambda.D_{x,y}$	$\lambda.D_{x,y}$	$\lambda.D_{x,y}$
0	4·7061622	4·6698806	4·6343817	4·5994787	4·5649689	4·5306171	4·4961736
1	·6880214	·6521312	·6169302	·5822238	·5477930	·5133953	·4787735
2	·6702719	·6346797	·5996753	·5650479	·5305712	·4959953	·4611827
3	·6528205	·6174248	·5824994	·5478261	·5131711	·4784045	·4434019
4	·6355656	·6002489	·5652776	·5304260	·4955804	·4606237	·4254460
5	·6183897	·5830271	·5478775	·5128352	·4777996	·4426678	·4073343
6	·6011679	·5656270	·5302867	·4950545	·4598437	·4245561	·3890871
7	·5837678	·5480362	·5125059	·4770986	·4417320	·4063089	·3707107
8	·5661770	·5302554	·4945501	·4589869	·4234848	·3879325	·3521972
9	·5483962	·5122995	·4764384	·4407397	·4051084	·3694190	·3335433
10	·5304403	·4941879	·4581912	·4223633	·3865949	·3507650	·3147649
11	·5123286	·4759407	·4398148	·4038498	·3679409	·3319867	·2958835
12	·4940815	·4575643	·4213013	·3851958	·3491625	·3131053	·2769115
13	·4757051	·4390508	·4026473	·3664174	·3302812	·2941333	·2578617
14	·4571916	·4203968	·3838689	·3475360	·3113092	·2750835	·2387575
15	·4385376	·4016184	·3649875	·3285641	·2922594	·2559793	·2195977
16	·4197592	·3827370	·3460155	·3095143	·2731552	·2368195	·2003811
17	·4008778	·3637650	·3269658	·2904101	·2539954	·2176029	·1811116
18	·3819058	·3447152	·3078616	·2712503	·2347788	·1983334	·1617776
19	·3628560	·3256111	·2887018	·2520337	·2155093	·1789993	·1423772
20	·3437518	·3064513	·2694852	·2327642	·1961752	·1595990	·1229035
21	·3245921	·2872347	·2502157	·2134301	·1767748	·1401253	·1033491
22	·3053755	·2679652	·2308816	·1940297	·1573012	·1205709	·0837065
23	·2861060	·2486311	·2114812	·1745560	·1377468	·1009283	·0639619
24	4·2667719	4·2292307	4·1920075	4·1550017	4·1181042	4·0811837	4·0440953
74	2·5167544	2·4009099	2·2784496	2·1489109	2·0103437	1·8644410	1·7093442
75	·4190507	·2962051	·1663564	2·0275986	1·8816168	·7265660	·5621882
76	·3143459	·1841119	2·0450441	1·8988717	·7437419	·5794100	·4054587
77	·2022527	2·0627996	1·9163172	·7609967	·5965859	·4226805	·2384700
78	2·0809404	1·9340727	·7784422	·6138408	·4398564	·2556918	1·0616544
79	1·9522135	·7961977	·6312862	·4571113	·2728677	1·0788762	0·8748015
80	·8143385	·6490417	·4745568	·2901226	1·0960521	0·8920233	·6781095
81	·6671825	·4923122	·3075681	1·1133070	0·9091992	·6953313	·4721927
82	·5104530	·3253236	1·1307525	0·9264541	·7125072	·4894144	·2576717
83	·3434643	1·1485080	0·9438996	·7297621	·5065903	·2748935	0·0417778
84	1·1666488	0·9616551	·7472076	·5238452	·2920693	0·0589996	9·8229659
85	0·9797959	·7649631	·5412907	·3093242	0·0761755	9·8401877	·5864253
86	·7831039	·5590462	·3267697	0·0934303	9·8573636	·6036471	·3634575
87	·5771870	·3445252	0·1108758	9·8746185	·6208230	·3806793	9·1379122
88	·3626660	0·1286313	9·8920639	·6380779	·3978552	9·1551340	8·9191003
89	0·1467721	9·9098194	·6555234	·4151101	9·1723099	8·9363221	·6825597
90	9·9279602	·6732788	·4325556	9·1895648	8·9534980	·6997815	8·1907466
91	·6914196	·4503111	9·2070103	8·9707529	·7169574	8·2079683	
92	·4684518	·2247658	8·9881984	·7342123	8·2251442		
93	·2429066	9·0059539	·7516578	8·2423991			
94	9·0240947	8·7694133	8·2598446				
95	8·7875541	8·2776001					
96	8·2957409						

An attentive examination of the preceding formulæ, and the construction of Tables **12** and **13**, will suggest a variety of means by which tests may be applied to ensure the correctness of the quantities $\lambda.D_{x,y}$ in the latter Table. One which will be found very simple and convenient is in the application of $\lambda.p_x + \frac{1}{2}\lambda.v$, and which is tabulated in column (3) Table **12**, as $\lambda.p_y + \frac{1}{2}\lambda.v$, x in the series now under consideration being constant, and taking the place of y in that column. If then $\lambda.p_x + \frac{1}{2}\lambda.v$ be continuously added to the results in any one column of Table **13**, it will always produce the $\lambda.D_{x,y}$ in the next column, one place higher in order; for example, $\lambda.p_{10} + \frac{1}{2}\lambda.v = 9{\cdot}9818592$ if added to any quantity in column "Age" 10, Table **13**, will produce $\lambda.D_{x,y}$ in column "Age" 11, but one place higher in order. In like manner will $\lambda.p_{15} + \frac{1}{2}\lambda.v = 9{\cdot}9827782$, if added to the figures in column "Age" 15, produce the results in column "Age" 16, but one place higher in order.

The whole of the series of Tables, of which Table **13** is a specimen, having been calculated according to the formulæ already pointed out, and various modes of verification employed to test the accuracy of the results, the next step was to find the natural numbers of $\lambda.D_{x,y}$. This having been done, the values of $\lambda.D_{x,y}$, taken horizontally from Table **13**, were arranged vertically, in the same order, in Table **14**, and will be found in the various columns headed $D_{x,y}$ in that Table. The whole of the enlarged Table **14** being so far completed, the adjacent column in the same Table was formed from the expression

$$N_{x,y} = \Sigma D_{x,y}$$

In this manner has Table **14** been constructed, and all the results verified throughout.

In calculating the Auxiliary Tables, in pp. 148 and 494 *ante*, by the direct method, the use of logarithms, to five decimal places, would have been sufficient for all practical purposes, but by the continuous method followed in the construction of Tables **1** to **14** inclusive, where the results are determined by successive additions of constant quantities to an initial value, any original inaccuracy in these constants is increased at each step, and becomes magnified to a great extent at the end of the series. Extreme care is therefore necessary in the formation of the preliminary Table **12**, page 546, and particularly in regard to the constants $\lambda.(1+r)$, $\frac{1}{2}\lambda.v$, $\frac{1}{2}\lambda'.v$ and $\lambda'.v$, all of which may be derived from $\lambda.v$. In page 532 *ante* will be found, for ten different rates of interest, the $\lambda.v$ to twelve places of decimals calculated with the Logarithms in the large edition of Vega, and will meet most cases which are likely to arise, but should the $\lambda.v$ for intermediate rates of interest, or for higher or lower rates than those given in page 532 be required, they may be found in a few minutes by those not having at hand Tables of Logarithms to more than seven places, by the following formula. As the same necessity exists for accuracy in the use of the $\lambda.v^x$, given in the eighth column of Table **1**, page 533, a complete Table of the $\lambda.v^x$, from $\lambda.v_1$, to $\lambda.v_{110}$, for ten different rates of interest and to twelve places of decimals, will be found in a Table in the subsequent pages of this Contribution.

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Table 14.

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

Difference of Age, 0 Year.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
$x.$	$y.$			$x.$	$y.$		
10	10	50835	627817	61	61	437·42	2956·38
11	11	46761	576982	62	62	384·33	2518·96
12	12	43091	530221	63	63	336·27	2134·63
13	13	39763	487130	64	64	292·82	1798·36
14	14	36726	447367	65	65	253·69	1505·54
15	15	33933	410641	66	66	218·52	1251·85
16	16	31345	376708	67	67	187·09	1033·33
17	17	28932	345363	68	68	159·11	846·249
18	18	26680	316431	69	69	134·35	687·139
19	19	24583	289751	70	70	112·54	552·789
20	20	22632	265168	71	71	93·456	440·249
21	21	20821	242536	72	72	76·854	346·793
22	22	19143	221715	73	73	62·540	269·939
23	23	17589	202572	74	74	50·286	207·399
24	24	16152	184983	75	75	39·926	157·113
25	25	14822	168831	76	76	31·239	117·187
26	26	13594	154009	77	77	24·061	85·9483
27	27	12462	140415	78	78	18·198	61·8873
28	28	11420	127953	79	79	13·495	43·6893
29	29	10460	116533	80	80	9·7895	30·1943
30	30	9579·5	106073	81	81	6·9422	20·4048
31	31	8770·5	96493·8	82	82	4·8019	13·4626
32	32	8027·7	87723·3	83	83	3·2379	8·66066
33	33	7346·0	79695·6	84	84	2·1249	5·42276
34	34	6720·2	72349·6	85	85	1·3550	3·29786
35	35	6145·8	65629·4	86	86	·83662	1·94286
36	36	5618·7	59483·6	87	87	·49928	1·10624
37	37	5134·8	53864·9	88	88	·28557	·60696
38	38	4690·7	48730·1	89	89	·15786	·32139
39	39	4283·0	44039·4	90	90	·08366	·16353
40	40	3908·6	39756·4	91	91	·04248	·07987
41	41	3564·9	35847·8	92	92	·02064	·03739
42	42	3249·2	32282·9	93	93	·00957	·01675
43	43	2959·4	29033·7	94	94	·00424	·00718
44	44	2693·3	26074·3	95	95	·00179	·00294
45	45	2449·1	23381·0	96	96	·00072	·00115
46	46	2224·9	20931·9	97	97	·00028	·00043
47	47	2019·3	18707·0	98	98	·00010	·00015
48	48	1830·8	16687·7	99	99	·00004	·00005
49	49	1658·1	14856·9	100	100	·00001	·00001
50	50	1499·8	13198·8	101	101	·00000	·00000
51	51	1354·8	11699·0	102	102	·00000	·00000
52	52	1222·0	10344·2	103	103	·00000	·00000
53	53	1100·3	9122·20	104	104	·00000	·00000
54	54	988·94	8021·90	105	105	·00000	·00000
55	55	886·99	7032·96	106	106	·00000	·00000
56	56	793·77	6145·97				
57	57	708·68	5352·20				
58	58	630·99	4643·52				
59	59	560·26	4012·53				
60	60	495·89	3452·27				

Difference of Age, 96 Years.

10	106	·01976	·01976

96 Years.

Difference of Age 1 Year.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
$x.$	$y.$			$x.$	$y.$		
10	11	48755	601852	61	62	410·02	2728·37
11	12	44888	553097	62	63	359·50	2318·35
12	13	41393	508209	63	64	313·80	1958·85
13	14	38214	466816	64	65	272·55	1645·05
14	15	35301	428602	65	66	235·45	1372·50
15	16	32613	393301	66	67	202·20	1137·05
16	17	30114	360688	67	68	172·53	934·847
17	18	27783	330574	68	69	146·21	762·317
18	19	25610	302791	69	70	122·96	616·107
19	20	23587	277181	70	71	102·55	493·147
20	21	21707	253594	71	72	84·749	390·597
21	22	19964	231887	72	73	69·328	305·848
22	23	18349	211923	73	74	56·079	236·520
23	24	16855	193574	74	75	44·808	180·441
24	25	15473	176719	75	76	35·316	135·633
25	26	14195	161246	76	77	27·416	100·317
26	27	13016	147051	77	78	20·925	72·9005
27	28	11929	134035	78	79	15·671	51·9755
28	29	10929	122106	79	80	11·494	36·3045
29	30	10010	111177	80	81	8·2438	24·8105
30	31	9166·1	101167	81	82	5·7737	16·5667
31	32	8390·8	92001·3	82	83	3·9431	10·7930
32	33	7679·3	83610·5	83	84	2·6230	6·84989
33	34	7026·1	75931·2	84	85	1·6968	4·22689
34	35	6426·6	68905·1	85	86	1·0647	2·53009
35	36	5876·3	62478·5	86	87	·64630	1·46539
36	37	5371·3	56602·2	87	88	·37760	·81909
37	38	4907·7	51230·9	88	89	·21232	·44149
38	39	4482·2	46323·2	89	90	·11492	·22917
39	40	4091·5	41841·0	90	91	·05962	·11425
40	41	3732·8	37749·5	91	92	·02961	·05463
41	42	3403·4	34016·7	92	93	·01405	·02502
42	43	3100·9	30613·3	93	94	·00637	·01097
43	44	2823·3	27512·4	94	95	·00276	·00460
44	45	2568·3	24689·1	95	96	·00114	·00184
45	46	2334·3	22120·8	96	97	·00045	·00070
46	47	2119·6	19786·5	97	98	·00017	·00025
47	48	1922·8	17666·9	98	99	·00006	·00008
48	49	1742·3	15744·1	99	100	·00002	·00002
49	50	1576·9	14001·8	100	101	·00000	·00000
50	51	1425·4	12424·9	101	102	·00000	·00000
51	52	1286·7	10999·5	102	103	·00000	·00000
52	53	1159·6	97128·8	103	104	·00000	·00000
53	54	1043·1	8553·28	104	105	·00000	·00000
54	55	936·58	7510·18	105	106	·00000	·00000
55	56	839·09	6573·60				
56	57	750·02	5734·51				
57	58	668·71	4984·49				
58	59	594·58	4315·78				
59	60	527·09	3721·20				
60	61	465·74	3194·11				

Difference of Age, 95 Years.

10	105	·06131	·08026
11	106	·01895	·01895

95 Years.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, **2** YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	12	46803	576941	61	63	383·53	2509·99
11	13	43120	530138	62	64	335·47	2126·46
12	14	39781	487018	63	65	292·08	1790·99
13	15	36732	447237	64	66	252·96	1498·91
14	16	33929	410505	65	67	217·86	1245·95
15	17	31333	376576	66	68	186·46	1028·09
16	18	28919	345243	67	69	158·54	841·630
17	19	26669	316324	68	70	133·81	683·090
18	20	24573	289655	69	71	112·05	549·280
19	21	22624	265082	70	72	92·999	437·230
20	22	20814	242458	71	73	76·451	344·231
21	23	19137	221644	72	74	62·167	267·780
22	24	17584	202507	73	75	49·970	205·613
23	25	16147	184923	74	76	39·634	155·643
24	26	14818	168776	75	77	30·994	116·009
25	27	13591	153958	76	78	23 843	85·0153
26	28	12460	140367	77	79	18·020	61·1723
27	29	11418	127907	78	80	13·347	43·1523
28	30	10459	116489	79	81	9·6792	29·8053
29	31	9578·2	106031	80	82	6·8562	20·1261
30	32	8769·3	96452·5	81	83	4·7411	13·2699
31	33	8026·7	87683·2	82	84	3·1943	8·52880
32	34	7344·8	79656·5	83	85	2·0946	5·33450
33	35	6719·2	72311·7	84	86	1·3333	3·23990
34	36	6144·8	65592·5	85	87	·82251	1·90660
35	37	5617·6	59447·7	86	88	·48879	1·08409
36	38	5133·8	53830·1	87	89	·28074	·59530
37	39	4689·6	48696·3	88	90	·15457	·31456
38	40	4281·8	44006·7	89	91	·08189	·15999
39	41	3907·5	39724·9	90	92	·04156	·07810
40	42	3563·7	35817·4	91	93	·02016	·03654
41	43	3248·1	32253·7	92	94	·00935	·01638
42	44	2958·2	29005·6	93	95	·00414	·00703
43	45	2692·2	26047·4	94	96	·00175	·00289
44	46	2447·9	23355·2	95	97	·00071	·00114
45	47	2223·8	20907·3	96	98	·00028	·00043
46	48	2018·3	18683·5	97	99	·00010	·00015
47	49	1829·8	16665·2	98	100	·00004	·00005
48	50	1657·0	14835·4	99	101	·00001	·00001
49	51	1498·8	13178·4	100	102	·00000	·00000
50	52	1353·8	11679·6	101	103	·00000	·00000
51	53	1221·0	10325·8	102	104	·00000	·00000
52	54	1099·3	9104·88	103	105	·00000	·00000
53	55	987·92	8005·58	104	106	·00000	·00000
54	56	886·00	7017·66				
55	57	792·84	6131·66				
56	58	707·72	5338·82				
57	59	630·12	4631·10				
58	60	559·38	4000·98				
59	61	495·05	3441·60				
60	62	436·56	2946·55				

DIFFERENCE OF AGE, **94** YEARS.

10	104	·10570	·18269
11	105	·05880	·07699
12	106	·01819	·01819

94 YEARS.

DIFFERENCE OF AGE, **3** YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	13	44959	552974	61	64	357·89	2301·23
11	14	41440	508015	62	65	312·25	1943·34
12	15	38238	466575	63	66	271·07	1631·09
13	16	35304	428337	64	67	234·06	1360·02
14	17	32597	393033	65	68	200·91	1125·96
15	18	30089	360436	66	69	171·34	925·045
16	19	27759	330347	67	70	145·10	753·705
17	20	25589	302588	68	71	121·94	608·605
18	21	23569	276999	69	72	101·61	486·665
19	22	21693	253430	70	73	83·893	385·055
20	23	19952	231737	71	74	68·553	301·162
21	24	18338	211785	72	75	55·394	232·609
22	25	16844	193447	73	76	44·200	177·215
23	26	15463	176603	74	77	34·784	133·015
24	27	14188	161140	75	78	26·955	98·2308
25	28	13010	146952	76	79	20·532	71·2758
26	29	11925	133942	77	80	15·347	50·7438
27	30	10926	122017	78	81	11·240	35·3968
28	31	10008	111091	79	82	8·0500	24·1568
29	32	9163·7	101084	80	83	5·6300	16·1068
30	33	8388·7	91920·3	81	84	3·8408	10·4768
31	34	7677·2	83531·6	82	85	2·5508	6·63595
32	35	7024·0	75854·4	83	86	1·6459	4·08515
33	36	6424·5	68830·4	84	87	1·0300	2·43925
34	37	5874·3	62105·9	85	88	·62206	1·40925
35	38	5369·2	56531·6	86	89	·36341	·78719
36	39	4905·6	51162·4	87	90	·20438	·42378
37	40	4479·9	46256·8	88	91	·11014	·21940
38	41	4089·2	41776·9	89	92	·05708	·10926
39	42	3730·5	37687·7	90	93	·02829	·05218
40	43	3401·1	33957·2	91	94	·01341	·02389
41	44	3098·6	30556·1	92	95	·00608	·01048
42	45	2820·9	27457·5	93	96	·00263	·00440
43	46	2566·0	24636 6	94	97	·00109	·00177
44	47	2332·1	22070·6	95	98	·00043	·00068
45	48	2117·5	19738·5	96	99	·00017	·00025
46	49	1920·7	17621·0	97	100	·00006	·00008
47	50	1740·3	15700·3	98	101	·00002	·00002
48	51	1574·9	13960·0	99	102	·00000	·00000
49	52	1423·4	12385·1	100	103	·00000	·00000
50	53	1284·6	10961·7	101	104	·00000	·00000
51	54	1157·5	9677·10	102	105	·00000	·00000
52	55	1041·1	8519·60	103	106	·00000	·00000
53	56	934·56	7478·50				
54	57	837·16	6543·94				
55	58	748·12	5706·78				
56	59	666·87	4958·66				
57	60	592·81	4291·79				
58	61	525·36	3698·98				
59	62	464·03	3173·62				
60	63	408·36	2709·59				

DIFFERENCE OF AGE, **93** YEARS.

10	103	·17495	·35025
11	104	·10138	·17530
12	105	·05645	·07392
13	106	·01747	·01747

93 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 4 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	14	43208	529893	61	65	333·12	2102·14
11	15	39834	486685	62	66	289·80	1769·02
12	16	36752	446851	63	67	250·83	1479·22
13	17	33918	410099	64	68	215·85	1228·39
14	18	31303	376181	65	69	184·62	1012·54
15	19	28882	344878	66	70	156·81	827·923
16	20	26635	315996	67	71	132·23	671·113
17	21	24543	289361	68	72	110·58	538·883
18	22	22599	264818	69	73	91·664	428·303
19	23	20794	242219	70	74	75·226	336·639
20	24	19119	221425	71	75	61·085	261·413
21	25	17567	202306	72	76	48·998	200·328
22	26	16132	184739	73	77	38·791	151·330
23	27	14805	168607	74	78	30·251	112·539
24	28	13581	153802	75	79	23·212	82·2875
25	29	12452	140221	76	80	17·488	59·0755
26	30	11412	127769	77	81	12·924	41·5875
27	31	10454	116357	78	82	9·3480	28·6635
28	32	9574·6	105904	79	83	6·6103	19·3155
29	33	8766·0	96329·0	80	84	4·5609	12·7052
30	34	8023·5	87563·0	81	85	3·0670	8·14427
31	35	7341·8	79539·5	82	86	2·0043	5·07727
32	36	6716·0	72197·7	83	87	1·2715	3·07297
33	37	6141·7	65481·7	84	88	·77899	1·80147
34	38	5614·5	59340·0	85	89	·46249	1·02248
35	39	5130·6	53725·5	86	90	·26456	·55999
36	40	4686·2	48594·9	87	91	·14564	·29543
37	41	4278·4	43908·7	88	92	·07678	·14979
38	42	3904·0	39630·3	89	93	·03886	·07301
39	43	3560·2	35726·3	90	94	·01883	·03415
40	44	3244·5	32166·1	91	95	·00873	·01532
41	45	2954·8	28921·6	92	96	·00387	·00659
42	46	2688·7	25966·8	93	97	·00164	·00272
43	47	2444·6	23278·1	94	98	·00067	·00108
44	48	2220·6	20833·5	95	99	·00026	·00041
45	49	2015·1	18612·9	96	100	·00010	·00015
46	50	1826·7	16597·8	97	101	·00004	·00005
47	51	1654·0	14771·1	98	102	·00001	·00001
48	52	1495·7	13117·1	99	103	·00000	·00000
49	53	1350·7	11621·4	100	104	·00000	·00000
50	54	1217·9	10270·7	101	105	·00000	·00000
51	55	1096·2	9052·87	102	106	·00000	·00000
52	56	984·87	7956·67				
53	57	883·05	6971·80				
54	58	789·94	6088·75				
55	59	704·95	5298·81				
56	60	627·39	4593·86				
57	61	556·77	3966·47				
58	62	492·45	3409·70				
59	63	434·05	2917·25				
60	64	381·06	2483·20				

DIFFERENCE OF AGE, 92 YEARS.

10	102	·29407	·63020
11	103	·16779	·33613
12	104	·09732	·16834
13	105	·05423	·07102
14	106	·01679	·01679

92 YEARS.

DIFFERENCE OF AGE, 5 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	15	41533	507635	61	66	309·17	1912·68
11	16	38285	466102	62	67	268·15	1603·51
12	17	35308	427817	63	68	231·31	1335·36
13	18	32571	392509	64	69	198·34	1104·05
14	19	30047	359938	65	70	168·96	905·713
15	20	27712	329891	66	71	142·90	736·753
16	21	25547	302179	67	72	119·91	593·853
17	22	23534	276632	68	73	99·753	473·943
18	23	21663	253098	69	74	82·195	374 190
19	24	19926	231435	70	75	67·031	291·995
20	25	18315	211509	71	76	54·032	224·964
21	26	16824	193194	72	77	43·002	170·932
22	27	15445	176370	73	78	33·736	127·930
23	28	14173	160925	74	79	26·050	94·1941
24	29	12998	146752	75	80	19·770	68·1441
25	30	11916	133754	76	81	14·726	48·3741
26	31	10919	121838	77	82	10·749	33·6481
27	32	10002	110919	78	83	7·6761	22·8991
28	33	9159·0	100917	79	84	5·3550	15·2230
29	34	8384·3	91757·9	80	85	3·6421	9·86796
30	35	7672·9	83373·6	81	86	2·4100	6·22586
31	36	7019·8	75700·7	82	87	1·5484	3·81586
32	37	6420·3	68680·9	83	88	·96159	2·26746
33	38	5870·1	62260·6	84	89	·57917	1·30587
34	39	5365·0	56390·5	85	90	·33669	·72670
35	40	4901·2	51025·5	86	91	·18852	·39001
36	41	4475·5	46124·3	87	92	·10152	·20149
37	42	4084·6	41648·8	88	93	·05227	·09997
38	43	3725·9	37564·2	89	94	·02586	·04770
39	44	3396 4	33838·3	90	95	·01225	·02184
40	45	3093·9	30441·9	91	96	·00555	·00959
41	46	2816·3	27348 0	92	97	·00241	·00404
42	47	2561·5	24531·7	93	98	·00099	·00163
43	48	2327·7	21970·2	94	99	·00040	·00064
44	49	2113·2	19642·5	95	100	·00016	00024
45	50	1916·5	17529·3	96	101	·00006	·00008
46	51	1736·2	15612 8	97	102	·00002	·00002
47	52	1570·8	13876·6	98	103	·00000	·00000
48	53	1419·3	12305·8	99	104	·00000	·00000
49	54	1280·5	10886·5	100	105	·00000	.00000
50	55	1153·4	9605·97	101	106	·00000	·00000
51	56	1037·0	8452·57				
52	57	930·58	7415·57				
53	58	833·24	6484·99				
54	59	744·36	5651·75				
55	60	663·21	4907·39				
56	61	589·25	4244·18				
57	62	521·89	3654·93				
58	63	460·64	3133·04				
59	64	405·04	2672·40				
60	65	354·68	2267·36				

DIFFERENCE OF AGE, 91 YEARS.

10	101	·49138	1·09623
11	102	·28204	·60485
12	103	·16107	·32281
13	104	·09349	·16174
14	105	·05211	·06825
15	106	·01614	·01614

91 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 6 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	16	39918	486158	61	67	286·07	1732·96
11	17	36781	446240	62	68	247·28	1446·89
12	18	33907	409459	63	69	212·55	1199·61
13	19	31265	375552	64	70	181·53	987·061
14	20	28830	344287	65	71	153·98	805·531
15	21	26580	315457	66	72	129·59	651·551
16	22	24496	288877	67	73	108·17	521·961
17	23	22559	264381	68	74	89·448	413·791
18	24	20759	241822	69	75	73·240	324·343
19	25	19088	221063	70	76	59·292	251·103
20	26	17540	201975	71	77	47·420	191·811
21	27	16108	184435	72	78	37·398	144·391
22	28	14785	168327	73	79	29·051	106·993
23	29	13564	153542	74	80	22·187	77·9419
24	30	12439	139978	75	81	16·649	55·7549
25	31	11402	127539	76	82	12·248	39·1059
26	32	10447	116137	77	83	8·8264	26·8579
27	33	9568·0	105690	78	84	6·2185	18·0315
28	34	8760·2	96122·1	79	85	4·2762	11·8130
29	35	8018·0	87361·9	80	86	2·8618	7·53681
30	36	7336·5	79343·9	81	87	1·8617	4·67501
31	37	6710·8	72007·4	82	88	1·1710	2·81331
32	38	6136·4	65296·6	83	89	·71493	1·64231
33	39	5609·2	59160·2	84	90	·42163	·92738
34	40	5125·1	53551·0	85	91	·23992	·50575
35	41	4680·7	48425·9	86	92	·13141	·26583
36	42	4271·8	43745·2	87	93	·06911	·13442
37	43	3898·2	39473·4	88	94	·03479	·06531
38	44	3554·4	35575·2	89	95	·01682	·03052
39	45	3238·7	32020·8	90	96	·00779	·01370
40	46	2948·9	28782·1	91	97	·00345	·00591
41	47	2683·0	25833·2	92	98	·00147	·00246
42	48	2439·0	23150·2	93	99	·00061	·00099
43	49	2215·2	20711·2	94	100	·00024	·00038
44	50	2009·8	18496·0	95	101	·00009	·00014
45	51	1821·5	16486·2	96	102	·00004	·00005
46	52	1648·9	14664·7	97	103	·00001	·00001
47	53	1490·6	13015·8	98	104	·00000	·00000
48	54	1345·6	11525·2	99	105	·00000	·00000
49	55	1212·7	10179·6	100	106	·00000	·00000
50	56	1091·1	8966·88				
51	57	979·86	7875·78				
52	58	878·09	6895·92				
53	59	785·16	6017·83				
54	60	700·29	5232·67				
55	61	622·89	4532·38				
56	62	552·33	3909·49				
57	63	488·17	3357·16				
58	64	429·85	2868·99				
59	65	377·00	2439·14				
60	66	329·18	2062·14				

DIFFERENCE OF AGE, 90 YEARS.

10	100	·84715	1·89935
11	101	·47128	1·05220
12	102	·27074	·58092
13	103	·15473	·31018
14	104	·08985	·15545
15	105	·05009	·06560
16	106	·01551	·01551

90 YEARS.

DIFFERENCE OF AGE, 7 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	17	38350	465433	61	68	263·81	1562·95
11	18	35321	427083	62	69	227·23	1299·14
12	19	32547	391762	63	70	194·53	1071·91
13	20	29998	359215	64	71	165·43	877·384
14	21	27652	329217	65	72	139·63	711·954
15	22	25486	301565	66	73	116·90	572·324
16	23	23481	276079	67	74	96·996	455·424
17	24	21617	252598	68	75	79·703	358·428
18	25	19886	230981	69	76	64·784	278·725
19	26	18281	211095	70	77	52·035	213·941
20	27	16794	192814	71	78	41·240	161·906
21	28	15420	176020	72	79	32·205	120·666
22	29	14151	160600	73	80	24·743	88·4610
23	30	12981	146449	74	81	18·684	63·7180
24	31	11902	133468	75	82	13·846	45·0340
25	32	10908	121566	76	83	10·057	31·1880
26	33	9993·2	110658	77	84	7·1504	21·1310
27	34	9151·4	100665	78	85	4·9657	13·9806
28	35	8377·5	91513·9	79	86	3·3601	9·01489
29	36	7666·4	83136·4	80	87	2·2108	5·65479
30	37	7013·5	75470·0	81	88	1·4080	3·44399
31	38	6414·0	68456·5	82	89	·87064	2·03599
32	39	5863·7	62042·5	83	90	·52046	1·16535
33	40	5358·4	56178·8	84	91	·30045	·64489
34	41	4894·6	50820·4	85	92	·16724	·34444
35	42	4468·7	45925·8	86	93	·08946	·17720
36	43	4077·8	41457·1	87	94	·04599	·08774
37	44	3718·8	37379·3	88	95	·02262	·04175
38	45	3389·4	33660·5	89	96	·01069	·01913
39	46	3086·9	30271·1	90	97	·00485	·00844
40	47	2809·4	27184·2	91	98	·00211	·00359
41	48	2554·7	24374·8	92	99	·00089	·00148
42	49	2321·1	21820·1	93	100	·00037	·00059
43	50	2106·8	19499·0	94	101	·00014	·00022
44	51	1910·2	17392·2	95	102	·00006	·00008
45	52	1729·9	15482·0	96	103	·00002	·00002
46	53	1564·6	13752·1	97	104	·00000	·00000
47	54	1413·1	12187·5	98	105	·00000	·00000
48	55	1274·3	10774·4	99	106	·00000	·00000
49	56	1147·2	9500·07				
50	57	1030·9	8352·87				
51	58	924·59	7321·97				
52	59	827·42	6397·38				
53	60	738·67	5569·96				
54	61	657·71	4831·29				
55	62	583·86	4173·58				
56	63	516·65	3589·72				
57	64	455·54	3073·07				
58	65	400·09	2617·53				
59	66	349·90	2217·44				
60	67	304·59	1867·54				

DIFFERENCE OF AGE, 89 YEARS.

10	99	1·4021	3·22519
11	100	·81249	1·82309
12	101	·45240	1·01060
13	102	·26008	·55820
14	103	·14870	·29812
15	104	·08636	·14942
16	105	·04815	·06306
17	106	·01491	·01491

89 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 8 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	18	36828	445445	61	69	242·42	1402·71
11	19	33904	408617	62	70	207·97	1160·29
12	20	31228	374713	63	71	177·28	952·324
13	21	28773	343485	64	72	150·01	775·044
14	22	26515	314712	65	73	125·96	625·034
15	23	24430	288197	66	74	104·83	499·074
16	24	22501	263767	67	75	86·428	394·244
17	25	20708	241266	68	76	70·501	307·816
18	26	19045	220558	69	77	56·856	237·315
19	27	17503	201513	70	78	45·254	180·459
20	28	16076	184010	71	79	35·513	135·205
21	29	14758	167934	72	80	27·429	99·6922
22	30	13542	153176	73	81	20·837	72·2632
23	31	12420	139634	74	82	15·539	51·4262
24	32	11387	127214	75	83	11·370	35·8872
25	33	10435	115827	76	84	8·1474	24·5172
26	34	9558·0	105393	77	85	5·7098	16·3698
27	35	8751·6	95834·6	78	86	3·9019	10·6600
28	36	8010·2	87083·0	79	87	2·5957	6·75809
29	37	7328·9	79072·8	80	88	1·6720	4·16239
30	38	6703·3	71743·9	81	89	1·0468	2·49039
31	39	6128·9	65040·6	82	90	·63382	1·44359
32	40	5601·5	58911·7	83	91	·37088	·80977
33	41	5117·4	53310·2	84	92	·20943	·43889
34	42	4672·8	48192·8	85	93	·11386	·22946
35	43	4264·8	43520·0	86	94	·05954	·11560
36	44	3890·1	39255·2	87	95	·02991	·05606
37	45	3546·2	35365·1	88	96	·01438	·02615
38	46	3230·5	31818·9	89	97	·00666	·01177
39	47	2940·9	28588·4	90	98	·00296	·00511
40	48	2675·0	25647·5	91	99	·00128	·00215
41	49	2432·1	22972·5	92	100	·00054	·00087
42	50	2207·5	20540·4	93	101	·00021	·00033
43	51	2002·4	18332·9	94	102	·00008	·00012
44	52	1814·2	16330·5	95	103	·00003	·00004
45	53	1641·6	14516·3	96	104	·00001	·00001
46	54	1483·3	12874·7	97	105	·00000	·00000
47	55	1338·3	11391·4	98	106	·00000	·00000
48	56	1205·5	10053·1				
49	57	1084·0	8847·66				
50	58	972·80	7763·66				
51	59	871·23	6790·86				
52	60	778·43	5919·63				
53	61	693·76	5141·20				
54	62	616·50	4447·44				
55	63	545·14	3830·94				
56	64	482·11	3284·80				
57	65	424·01	2802·69				
58	66	371·32	2378·68				
59	67	323·76	2007·36				
60	68	280·89	1683·60				

DIFFERENCE OF AGE, 88 YEARS.

10	98	2·3050	5·40068
11	99	1·3447	3·09568
12	100	·77994	1·75098
13	101	·43459	·97104
14	102	·24995	·53645
15	103	·14293	·28650
16	104	·08300	·14357
17	105	·04626	·06057
18	106	·01431	·01431

88 YEARS.

DIFFERENCE OF AGE, 9 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	19	35351	426177	61	70	221·87	1252·20
11	20	32531	390826	62	71	189·52	1030·33
12	21	29953	358295	63	72	160·76	840·807
13	22	27589	328342	64	73	135·33	680·047
14	23	25416	300753	65	74	112·95	544·717
15	24	23411	275337	66	75	93·405	431·767
16	25	21555	251926	67	76	76·450	338·362
17	26	19832	230371	68	77	61·873	261·912
18	27	18234	210539	69	78	49·446	200·039
19	28	16755	192305	70	79	38·970	150·593
20	29	15386	175550	71	80	30·247	111·623
21	30	14123	160164	72	81	23·098	81·3756
22	31	12957	146041	73	82	17·329	58·2776
23	32	11883	133084	74	83	12·760	40·9486
24	33	10893	121201	75	84	9·2109	28·1886
25	34	9980·4	110309	76	85	6·5061	18·9777
26	35	9140·5	100329	77	86	4·4866	12·4716
27	36	8367·8	91188·1	78	87	3·0143	7·98496
28	37	7657·5	82820·3	79	88	1·9631	4·97066
29	38	7004·8	75162·8	80	89	1·2431	3·00756
30	39	6405·4	68158·0	81	90	·76209	1·76446
31	40	5854·9	61752·6	82	91	·45165	1·00237
32	41	5349·5	55897·7	83	92	·25853	·55072
33	42	4885·6	50548·2	84	93	·14258	·29219
34	43	4459·6	45662·6	85	94	·07578	·14961
35	44	4068·5	41203·0	86	95	·03872	·07383
36	45	3709·5	37134·5	87	96	·01902	·03511
37	46	3380·0	33425·0	88	97	·00895	·01609
38	47	3077·7	30045·0	89	98	·00406	.00714
39	48	2800·3	26967·3	90	99	·00180	·00308
40	49	2545·7	24167·0	91	100	·00077	·00128
41	50	2312·2	21621·3	92	101	·00031	·00051
42	51	2098·1	19309·1	93	102	·00013	·00020
43	52	1901·7	17211·0	94	103	·00005	·00007
44	53	1721·5	15309·3	95	104	·00002	·00002
45	54	1556·3	13587·8	96	105	·00000	·00000
46	55	1404·8	12031·5	97	106	·00000	·00000
47	56	1266·0	10626·7				
48	57	1139·1	93606·6				
49	58	1022·8	8221·56				
50	59	916·66	7198·76				
51	60	819·66	6282·10				
52	61	731·10	5462·44				
53	62	650·30	4731·34				
54	63	576·67	4081·04				
55	64	509 64	3504·37				
56	65	448·74	2994·73				
57	66	393·52	2545·99				
58	67	343·59	2152·47				
59	68	298·57	1808·88				
60	69	258·11	1510·31				

DIFFERENCE OF AGE, 87 YEARS.

10	97	3·7773	8·96124
11	98	2·2107	5·18394
12	99	1·2908	2·97324
13	100	·74924	1·68244
14	101	·41766	·93320
15	102	·24026	·51554
16	103	·13738	·27528
17	104	·07974	·13790
18	105	·04442	·05816
19	106	·01374	·01374

87 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, **10** YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	20	33919	407608	61	71	202·19	1111·41
11	21	31202	373689	62	72	171·86	909·215
12	22	28720	342487	63	73	145·02	737·355
13	23	26446	313767	64	74	121·35	592·335
14	24	24355	287321	65	75	100·64	470·985
15	25	22427	362966	66	76	82·621	370·345
16	26	20643	240539	67	77	67·094	287·724
17	27	18988	219896	68	78	53·809	220·630
18	28	17455	200908	69	79	42·580	166·821
19	29	16036	183453	70	80	33·191	124·241
20	30	14724	167417	71	81	25·471	91·0501
21	31	13513	152693	72	82	19·210	65·5791
22	32	12396	139180	73	83	14·230	46·3691
23	33	11367	126784	74	84	10·337	32·1391
24	34	10418	115417	75	85	7·3552	21·8021
25	35	9544·4	104999	76	86	5·1123	14·4469
26	36	8739·7	95454·4	77	87	3·4660	9·33458
27	37	7999·4	86714·7	78	88	2·2797	5·86858
28	38	7318·9	78715·3	79	89	1·4596	3·58888
29	39	6693·5	71396·4	80	90	·90498	2·12928
30	40	6119·0	64702·9	81	91	·54306	1·22430
31	41	5591·6	58583·9	82	92	·31483	·68124
32	42	5107·2	52992·3	83	93	·17600	·36641
33	43	4662·7	47885·1	84	94	·09489	·19041
34	44	4248·1	43222·4	85	95	·04928	·09552
35	45	3879 6	38974·3	86	96	·02462	·04624
36	46	3535·7	35094·7	87	97	·01184	·02162
37	47	3220·1	31559·0	88	98	·00546	·00978
38	48	2930·5	28338·9	89	99	·00247	·00432
39	49	2664·9	25408·4	90	100	·00109	·00185
40	50	2421·2	22743·5	91	101	·00045	·00076
41	51	2197·7	20322·3	92	102	·00019	·00031
42	52	1992·6	18124·6	93	103	·00008	·00012
43	53	1804·5	16132·0	94	104	.00003	·00004
44	54	1632·0	14327·5	95	105	·00001	·00001
45	55	1473·9	12695·5	96	106	·00000	·00000
46	56	1328·9	11221·6				
47	57	1196·3	9892·66				
48	58	1074·8	8696·36				
49	59	963·82	7621·56				
50	60	862·39	6657·74				
51	61	769·82	5795·35				
52	62	685·30	5025·53				
53	63	608·28	4340·23				
54	64	538·13	3731·95				
55	65	474·36	3193·82				
56	66	416·48	2719·46				
57	67	364·13	2302·98				
58	68	316·85	1938·85				
59	69	274·36	1622·00				
60	70	236·23	1347·64				

DIFFERENCE OF AGE, **86** YEARS.

10	96	6·0688	14·6705
11	97	3·6228	8·60170
12	98	2·1221	4·97890
13	99	1·2400	2·85680
14	100	·72005	1·61680
15	101	·40146	·89675
16	102	·23091	·49529
17	103	·13198	·26438
18	104	·07658	·13240
19	105	·04264	·05582
20	106	·01318	·01318

86 YEARS.

DIFFERENCE OF AGE, **11** YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	21	32533	389743	61	72	183·35	980·322
11	22	29919	357210	62	73	155·04	796·972
12	23	27531	327291	63	74	130·04	641·932
13	24	25343	299760	64	75	108·13	511·892
14	25	23331	274417	65	76	89·022	403·762
15	26	21478	251086	66	77	72·510	314·740
16	27	19764	229608	67	78	58·350	242·230
17	28	18177	209844	68	79	46·338	183·880
18	29	16706	191677	69	80	36·266	137·542
19	30	15346	174961	70	81	27·951	101·276
20	31	14089	159615	71	82	21·184	73·3255
21	32	12928	145526	72	83	15·775	52·1415
22	33	11858	132598	73	84	11·528	36·3665
23	34	10872	120740	74	85	8·2546	24·8385
24	35	9963·2	109868	75	86	5·7795	16·5839
25	36	9125·8	99905·2	76	87	3·9493	10·8044
26	37	8354·9	90779·4	77	88	2·6213	6·85507
27	38	7645·7	82424·5	78	89	1·6949	4·23377
28	39	6993·6	74778·8	79	90	1·0625	2·53887
29	40	6394·2	67785·2	80	91	·64488	1·47637
30	41	5843·8	61391·0	81	92	·37855	·83149
31	42	5338·3	55547·2	82	93	·21433	·45294
32	43	4874·1	50208·9	83	94	·11714	·23861
33	44	4448·1	45334·8	84	95	·06171	·12147
34	45	4056·9	40886·7	85	96	·03133	·05976
35	46	3697·8	36829·8	86	97	·01532	·02843
36	47	3368·4	33132·0	87	98	·00722	·01311
37	48	3066·1	29763·6	88	99	·00332	·00589
38	49	2788·8	26697·5	89	100	·00149	·00257
39	50	2534·5	23908·7	90	101	·00063	·00103
40	51	2301·2	21374 2	91	102	·00027	·00045
41	52	2087·1	19073·0	92	103	·00011	·00018
42	53	1890·8	16985·9	93	104	·00005	·00007
43	54	1710·8	15095·1	94	105	.00002	·00002
44	55	1545·6	13384·3	95	106	·00000	·00000
45	56	1394·3	11838·7				
46	57	1255·7	10444·4				
47	58	1128·8	9188·71				
48	59	1012·8	8059·91				
49	60	906·76	7047·11				
50	61	809·95	6140·35				
51	62	721·59	5330·41				
52	63	641·03	4608·81				
53	64	567·63	3967·78				
54	65	500·88	3400·15				
55	66	440·25	2899·27				
56	67	385·37	2459·02				
57	68	335·79	2073·65				
58	69	291·16	1737·86				
59	70	251·10	1446·70				
60	71	215·28	1195·60				

DIFFERENCE OF AGE, **85** YEARS.

10	95	9·5454	23·6095
11	96	5·8025	14·0641
12	97	3·4777	8·26164
13	98	2·0386	4·78394
14	99	1·1917	2·74534
15	100	·69213	1·55364
16	101	·38586	·86151
17	102	·22185	·47565
18	103	·12674	·25380
19	104	·07351	·12706
20	105	·04091	·05355
21	106	·01264	·01264

85 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 12 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	22	31195	372540	61	73	165·40	858·879
11	23	28679	341345	62	74	139·02	693·479
12	24	26382	312666	63	75	115·87	554·459
13	25	24277	286284	64	76	95·642	438·589
14	26	22344	262007	65	77	78·128	342·947
15	27	20564	239663	66	78	63·060	264·819
16	28	18920	219099	67	79	50·248	201·759
17	29	17396	200179	68	80	39·466	151·511
18	30	15987	182783	69	81	30·540	112·045
19	31	14683	166796	70	82	23·246	81·5053
20	32	13479	152113	71	83	17·395	58·2593
21	33	12367	138634	72	84	12·779	40·8643
22	34	11342	126267	73	85	9·2055	28·0853
23	35	10397	114925	74	86	6·4862	18·8798
24	36	9526·4	104528	75	87	4·4648	12·3936
25	37	8724·1	95001·5	76	88	2·9868	7·92883
26	38	7985·4	86277·4	77	89	1·9489	4·94203
27	39	7305·9	78292·0	78	90	1·2339	2·99313
28	40	6680·9	70986·1	79	91	·75717	1·75923
29	41	6106·6	64305·2	80	92	·44952	1·00206
30	42	5579·0	58198·6	81	93	·25771	·55254
31	43	5094·7	52619·6	82	94	·14265	·29483
32	44	4649·9	47524·9	83	95	·07618	·15218
33	45	4241·5	42875·0	84	96	·03924	·07600
34	46	3866·7	38633·5	85	97	·01950	·03676
35	47	3522·8	34766·8	86	98	·00935	·01726
36	48	3207·3	31244·0	87	99	·00439	·00791
37	49	2917·9	28036·7	88	100	·00201	·00352
38	50	2652·4	25118·8	89	101	·00087	·00151
39	51	2408·9	22466·4	90	102	·00038	·00064
40	52	2185·4	20057·5	91	103	·00016	·00026
41	53	1980·5	17872·1	92	104	·00007	·00010
42	54	1792·6	15891·6	93	105	·00003	·00003
43	55	1620·2	14099·0	94	106	·00000	·00000
44	56	1462·2	12478·8				
45	57	1317·4	11016·6				
46	58	1184·9	9699·22				
47	59	1063·6	8514·32				
48	60	952·83	7450·72				
49	61	851·63	6497·89				
50	62	759·21	5646·26				
51	63	674·97	4887·05				
52	64	598·18	4212·08				
53	65	528·34	3613·90				
54	66	464·86	3085·56				
55	67	407·37	2620·70				
56	68	355·38	2213·33				
57	69	308·56	1857·95				
58	70	266·47	1549·39				
59	71	228·82	1282·92				
60	72	195·22	1054·10				

DIFFERENCE OF AGE, 84 YEARS.

10	94	14·677	37·3573
11	95	9·1549	22·6803
12	96	5·5874	13·5254
13	97	3·3408	7·93801
14	98	1·9592	4·59721
15	99	1·1455	2·63801
16	100	·66522	1·49251
17	101	·37070	·82729
18	102	·21304	·45659
19	103	·12166	·24355
20	104	·07053	.12189
21	105	·03924	·05136
22	106	·01212	·01212

84 YEARS.

DIFFERENCE OF AGE, 13 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	23	29902	355988	61	74	148·31	747·008
11	24	27482	326086	62	75	123·87	598·698
12	25	25272	298604	63	76	102·49	474·828
13	26	23250	273332	64	77	83·938	372·338
14	27	21393	250082	65	78	67·946	288·400
15	28	19685	228689	66	79	54·304	220·454
16	29	18108	209004	67	80	42·797	166·150
17	30	16648	190896	68	81	33·235	123·353
18	31	15297	174248	69	82	25·399	90·1178
19	32	14048	158951	70	83	19·089	64·7188
20	33	12894	144903	71	84	14·092	45·6298
21	34	11829	132009	72	85	10·205	31·5378
22	35	10847	120180	73	86	7·2334	21·3328
23	36	9941·2	109333	74	87	5·0107	14·0994
24	37	9106·9	99392·0	75	88	3·3767	9·08869
25	38	8338·3	90285·1	76	89	2·2207	5·71199
26	39	7630·5	81946·8	77	90	1·4188	3·49129
27	40	6979·2	74316·3	78	91	·87925	2·07249
28	41	6380·4	67337·1	79	92	·52779	1·19324
29	42	5829·9	60956·7	80	93	·30603	·66545
30	43	5324·5	55126·8	81	94	·17152	·35942
31	44	4860·2	49802·3	82	95	·09277	·18790
32	45	4434·0	44942·1	83	96	·04843	·09513
33	46	4042·8	40508·1	84	97	·02442	·04670
34	47	3683·8	36465·3	85	98	·01190	·02228
35	48	3354·4	32781·5	86	99	·00569	·01038
36	49	3052·2	29427·1	87	100	·00265	·00469
37	50	2775·1	26374·9	88	101	·00117	·00204
38	51	2520·9	23599·8	89	102	·00052	·00087
39	52	2286·7	21078·9	90	103	·00022	·00035
40	53	2073·8	18792·2	91	104	·00009	·00013
41	54	1877·6	16718·4	92	105	·00004	·00004
42	55	1697·7	14840·8	93	106	·00000	·00000
43	56	1532·7	13143·1				
44	57	1381·6	11610·4				
45	58	1243·1	10228·8				
46	59	1116·5	8985·73				
47	60	1000·7	7869·23				
48	61	894·89	6868·53				
49	62	798·27	5973·64				
50	63	710·16	5175·37				
51	64	629·86	4465·21				
52	65	556·78	3835·35				
53	66	690·35	3278·57				
54	67	430·14	2788·22				
55	68	375·67	2358·08				
56	69	326·56	1982·41				
57	70	282·40	1655·85				
58	71	242·84	1373·45				
59	72	207·50	1130·61				
60	73	176·10	923·108				

DIFFERENCE OF AGE, 83 YEARS.

10	93	22·053	57·9136
11	94	14·077	35·8606
12	95	8·7882	21·7836
13	96	5·3674	12·9954
14	97	3·2106	7·62801
15	98	1·8832	4·41741
16	99	1·1010	2·53421
17	100	·63910	1·43321
18	101	·35599	·79411
19	102	·20450	·43812
20	103	·11673	·23362
21	104	·06765	·11689
22	105	·03762	·04924
23	106	·01162	·01162

83 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 14 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	24	28654	340068	61	75	132·15	644·623
11	25	26327	311414	62	76	109·57	512·473
12	26	24203	285087	63	77	89·950	402·903
13	27	22261	260884	64	78	72·998	312·953
14	28	20479	238623	65	79	58·511	239·955
15	29	18840	218144	66	80	46.251	181·444
16	30	17328	199304	67	81	36·039	135·193
17	31	15929	181976	68	82	27·641	99·1540
18	32	14635	166047	69	83	20·857	71·5130
19	33	13438	151412	70	84	15·464	50·6560
20	34	12332	137974	71	85	11·253	35·1920
21	35	11312	125642	72	86	8·0186	23·9390
22	36	10371	114330	73	87	5·5879	15·9204
23	37	9503·6	103959	74	88	3·7895	10·3325
24	38	8704·2	94455·4	75	89	2·5105	6·54300
25	39	7967·7	85751·2	76	90	1·6166	4·03250
26	40	7289·3	77783·5	77	91	1·0110	2·41590
27	41	6665·3	70494·2	78	92	·61289	1·40490
28	42	6091·4	63828·9	79	93	·35931	·79201
29	43	5563·9	57737·5	80	94	·20368	·43270
30	44	5079·4	52173·6	81	95	·11155	·22902
31	45	4634·6	47094·2	82	96	·05898	·11747
32	46	4226.2	42459·6	83	97	·03015	·05849
33	47	3851·5	38233·4	84	98	·01490	·02834
34	48	3507·6	34381·9	85	99	·00724	·01344
35	49	3192·2	30874·3	86	100	·00344	·00620
36	50	2902·9	27682·1	87	101	·00154	·00276
37	51	2637.6	24779·2	88	102	·00070	·00122
38	52	2394·1	22141·6	89	103	·00031	·00052
39	53	2170·9	19747·5	90	104	·00014	·00021
40	54	1966·0	17576·6	91	105	·00006	·00007
41	55	1778·2	15610·6	92	106	·00001	·00001
42	56	1606·0	13832·4				
43	57	1448·2	12226·4				
44	58	1303·6	10778·2				
45	59	1171·4	9474·62				
46	60	1050·4	8303·22				
47	61	939·83	7252·82				
48	62	838·83	6312·99				
49	63	746·70	5474·16				
50	64	662·70	4727·46				
51	65	586·26	4064·76				
52	66	516·74	3478·50				
53	67	453·72	2961·76				
54	68	396·67	2508·04				
55	69	345·21	2111·37				
56	70	298·88	1766·16				
57	71	257·35	1467·28				
58	72	220·21	1209·93				
59	73	187·19	989·723				
60	74	157·91	802·533				

DIFFERENCE OF AGE, 82 YEARS.

10	92	32·393	87·9870
11	93	21·151	55·5940
12	94	13·513	34·4430
13	95	8·4422	20·9300
14	96	5·1583	12·4878
15	97	3·0861	7·32949
16	98	1·8100	4·24339
17	99	1·0577	2·43339
18	100	·61373	1·37569
19	101	·34171	·76196
20	102	·19621	·42025
21	103	·11196	·22404
22	104	·06487	·11208
23	105	·03607	·04721
24	106	·01114	·01114

82 YEARS.

DIFFERENCE OF AGE, 15 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	25	27450	324762	61	76	116·90	551·546
11	26	25213	297312	62	77	96·162	434·646
12	27	23173	272099	63	78	78·227	338·484
13	28	21309	248926	64	79	62·862	260·257
14	29	19600	227617	65	80	49·834	197·395
15	30	18029	208017	66	81	38·949	147·561
16	31	16581	189988	67	82	29·973	108·612
17	32	15240	173407	68	83	22·697	78·6388
18	33	14000	158167	69	84	16·896	55·9418
19	34	12853	144167	70	85	12·349	39·0458
20	35	11794	131314	71	86	8·8424	26·6968
21	36	10816	119520	72	87	6·1945	17·8544
22	37	9914·3	108705	73	88	4·2261	11·6599
23	38	9083·3	98790·5	74	89	2·8175	7·43376
24	39	8317·4	89707·2	75	90	1·8276	4·61626
25	40	7611·4	81389·8	76	91	1·1520	2·78866
26	41	6961·5	73778·4	77	92	·70474	1·63666
27	42	6363·3	66816·9	78	93	·41725	·93192
28	43	5813·4	60453·6	79	94	·23914	·51467
29	44	5307·9	54640·2	80	95	·13246	·27553
30	45	4843·6	49332·3	81	96	·07092	·14307
31	46	4417·4	44488 7	82	97	·03671	·07215
32	47	4026.2	40071·3	83	98	·01840	·03544
33	48	3667·3	36045·1	84	99	·00906	·01704
34	49	3338·0	32377·8	85	100	·00437	·00798
35	50	3036·0	29039·8	86	101	·00199	·00361
36	51	2759 0	26003·8	87	102	·00092	·00162
37	52	2504·9	23244·8	88	103	·00041	·00070
38	53	2271·9	20739·9	89	104	·00019	·00029
39	54	2058·1	18468·0	90	105	·00008	·00010
40	55	1862·0	16409·9	91	106	·00002	·00002
41	56	1682·2	14547·9				
42	57	1517·5	12865·7				
43	58	1366·5	11348·2				
44	59	1228·4	9981·73				
45	60	1102·0	8753·33				
46	61	986·51	7651·33				
47	62	880·95	6664·82				
48	63	784·64	5783·87				
49	64	696·79	4999·23				
50	65	616·83	4302·44				
51	66	544·11	3685·61				
52	67	478·14	3141·50				
53	68	418·41	2663·36				
54	69	364·50	2244·95				
55	70	315·94	1880·45				
56	71	272·37	1564·51				
57	72	233·38	1292·14				
58	73	198·65	1058·76				
59	74	167·85	860·106				
60	75	140·71	692·256				

DIFFERENCE OF AGE, 81 YEARS.

10	91	46·471	13·0936
11	92	31·068	84·4653
12	93	20·303	53·3973
13	94	12·981	33·0943
14	95	8·1133	20·1133
15	96	4·9583	12·0000
16	97	2·9661	7·04165
17	98	1·7389	4·07555
18	99	1·0157	2·33665
19	100	·58911	1·32095
20	101	·32787	·73184
21	102	·18820	·40397
22	103	·10736	·21577
23	104	·06218	·10841
24	105	·03456	·04623
25	106	·01167	·01167

81 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 16 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	26	26288	310051	61	77	102·59	467·578
11	27	24140	283763	62	78	83·630	364·988
12	28	22183	259623	63	79	67·365	281·358
13	29	20395	237440	64	80	53·540	213·993
14	30	18757	217045	65	81	41·966	160·453
15	31	17251	198288	66	82	32·393	118·487
16	32	15863	181037	67	83	24·613	86·0944
17	33	14579	165174	68	84	18·387	61·4814
18	34	13390	150595	69	85	13·492	43·0944
19	35	12291	137205	70	86	9·7031	29·6024
20	36	11277	124914	71	87	6·8309	19·8993
21	37	10340	113637	72	88	4·6848	13·0684
22	38	9475·9	103297	73	89	3·1420	8·38360
23	39	8679·6	93820·6	74	90	2·0511	5·24160
24	40	7945·5	85141·0	75	91	1·3024	3·19050
25	41	7269·1	77195·5	76	92	·80301	1 88810
26	42	6646·1	69926·4	77	93	·47977	1·08509
27	43	6073·0	63280·3	78	94	·27770	·60532
28	44	5545·9	57207·3	79	95	·15553	·32762
29	45	5061·4	51661·4	80	96	·08421	·17209
30	46	4616·6	46600·0	81	97	·04414	·08788
31	47	4208·4	41983·4	82	98	·02240	·04374
32	48	3833·7	37775·0	83	99	·01119	·02134
33	49	3490·0	33941·3	84	100	·00548	·01015
34	50	3174·7	30451·3	85	101	·00254	·00467
35	51	2885·6	27276·6	86	102	·00119	·00213
36	52	2620·3	24391·0	87	103	·00055	·00094
37	53	2377·0	21770·7	88	104	·00025	.00039
38	54	2153·8	19393·7	89	105	·00011	·00014
39	55	1949·1	17239·9	90	106	·00003	·00003
40	56	1761·4	15290·8				
41	57	1589·5	13529·4				
42	58	1431·9	11939·9				
43	59	1287·7	10508·0				
44	60	1155·7	9220·31				
45	61	1035·0	8064·61				
46	62	924·71	7029·61				
47	63	824·04	6104·90				
48	64	732·19	5280·86				
49	65	648·56	4548·67				
50	66	572·47	3900·11				
51	67	503·46	3327·64				
52	68	440·94	2824·16				
53	69	384·48	2383·24				
54	70	333·60	1998·76				
55	71	287·91	1665·16				
56	72	246·99	1377 25				
57	73	210·53	1130·26				
58	74	178·13	919·728				
59	75	149·56	741·598				
60	76	124·46	592·838				

DIFFERENCE OF AGE, 80 YEARS.

10	90	65·214	190·911
11	91	44·570	125·697
12	92	29·823	81·1268
13	93	19·504	51·3038
14	04	12·475	31·7998
15	95	7·7987	19·3248
16	96	4·7655	11·5261
17	97	2·8497	6·76060
18	98	1·6699	3 91090
19	99	·97500	2·24100
20	100	·56525	1·26600
21	101	·31447	·70075
22	102	·18046	·38628
23	103	·10291	·20582
24	104	·05958	·10291
25	105	·03311	·04333
26	106	·01022	·01022

80 YEARS.

DIFFERENCE OF AGE, 17 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	27	25170	295912	61	78	89·220	392·479
11	28	23108	270742	62	79	72·018	303·259
12	29	21231	247634	63	80	57·376	231·241
13	30	19517	226403	64	81	45·087	173·865
14	31	17947	206886	65	82	34·902	128·778
15	32	16505	188939	66	83	26·599	93·8760
16	33	15174	172434	67	84	19·939	67·2770
17	34	13944	157260	68	85	14·683	47·3380
18	35	12805	143316	69	86	10·602	32·6550
19	36	11753	130511	70	87	7·4958	22 0530
20	37	10780	118758	71	88	5·1661	14·5572
21	38	9882·5	107978	72	89	3·4831	9·39107
22	39	9054·7	98095·1	73	90	2·2874	5·90797
23	40	8291·5	89040·4	74	91	1·4616	3·62057
24	41	7588·1	80748·9	75	92	·90782	2·15897
25	42	6939·8	73160·8	76	93	·54668	1·25115
26	43	6342·8	66221·0	77	94	·31932	·70447
27	44	5793·5	59878·2	78	95	·18060	·38515
28	45	5288·4	54084·7	79	96	·09888	·20455
29	46	4824·2	48796·3	80	97	·05242	·10567
30	47	4398·2	43972·1	81	98	·02694	·05325
31	48	4007·1	39573·9	82	99	·01363	·02631
32	49	3648·3	35566·8	83	100	·00676	·01268
33	50	3319·2	31918·5	84	101	·00318	·00592
34	51	3017·4	28599·3	85	102	·00152	·00274
35	52	2740·4	25581·9	86	103	·00071	·00122
36	53	2486·4	22841·5	87	104	·00033	·00051
37	54	2253·4	20355·1	88	105	·00015	·00018
38	55	2039·8	18101·7	89	106	·00003	·00003
39	56	1843·8	16061·9				
40	57	1664·3	14218·1				
41	58	1499·8	12553·8				
42	59	1349·2	11054·0				
43	60	12·114	9704·83				
44	61	1085·4	8493·43				
45	62	970·18	7408·03				
46	63	864·97	6437·85				
47	64	768·96	5572·88				
48	65	681·51	4803·92				
49	66	601·92	4122·41				
50	67	529·71	3520·49				
51	68	464·29	2990·78				
52	69	405·18	2526·49				
53	70	351·89	2121·31				
54	71	304·01	1769·42				
55	72	261·09	1465·41				
56	73	222·81	1204·32				
57	74	188·78	981·509				
58	75	158·72	792 729				
59	76	132·30	634·009				
60	77	109·23	501·709				

DIFFERENCE OF AGE, 79 YEARS.

10	89	89·580	272·858
11	90	62·546	183·278
12	91	42·784	120·732
13	92	28·649	77·9477
14	93	18·744	49·2987
15	94	11·992	30·5547
16	95	7·4955	18·5627
17	96	4·5784	11·0672
18	97	2·7365	6·48877
19	98	1·6029	3·75227
20	99	·93551	2·14937
21	100	·54216	1·21386
22	101	·30154	·67170
23	102	·17298	·37016
24	103	·09861	·19718
25	104	·05708	·09857
26	105	·03171	·04149
27	106	·00978	·00978

79 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 18 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	28	24094	282333	61	79	76·831	325·964
11	29	22116	258239	62	80	61·338	249·133
12	30	20317	236123	63	81	48·316	187·795
13	31	18675	215806	64	82	37·498	139·479
14	32	17170	197131	65	83	28·660	101·981
15	33	15788	179961	66	84	21·548	73·3214
16	34	14514	164173	67	85	15·922	51·7734
17	35	13335	149659	68	86	11·537	35·8514
18	36	12244	136324	69	87	8·1901	24·3144
19	37	11235	124080	70	88	5·6690	16·1243
20	38	10303	112845	71	89	3·8409	10·4553
21	39	9443 3	102542	72	90	2·5357	6·61439
22	40	8649·9	93098·3	73	91	1·6300	4·07869
23	41	7918·6	84448·4	74	92	1·0188	2·44869
24	42	7244·4	76529·8	75	93	·61803	1·42989
25	43	6623·1	69285·4	76	94	·36384	·81186
26	44	6050·9	62662·3	77	95	·20767	·44802
27	45	5524·5	56611·4	78	96	·11482	·24035
28	46	5040·6	51086·9	79	97	·06155	·12553
29	47	4596·0	46046·3	80	98	·03198	06398
30	48	4187·9	41450·3	81	99	·01638	·03200
31	49	3813·4	37262 4	82	100	·00823	·01562
32	50	3469 8	33449·0	83	101	·00392	·00739
33	51	3158·7	29979·2	84	102	·00190	·00347
34	52	2865·6	26820·5	85	103	·00090	·00157
35	53	2600·5	23954·9	86	104	·00043	·00067
36	54	2357·2	21354·4	87	105	·00019	·00024
37	55	2134·1	18997·2	88	106	·00005	·00005
38	56	1929·6	16863·1				
39	57	1742·2	14933·5				
40	58	1570·4	13191·3				
41	59	1413·2	11620·9				
42	60	1269·3	10207·7				
43	61	1137·8	8938·36				
44	62	1017·4	7800·56				
45	63	907·50	6783·16				
46	64	807·15	5875·66				
47	65	715·73	5068·51				
48	66	632·50	4352·78				
49	67	556·97	3720·28				
50	68	488·49	3163·31				
51	69	426·64	2674·82				
52	70	370·83	2248·18				
53	71	320·67	1877·35				
54	72	275·69	1556·68				
55	73	235·53	1280·99				
56	74	199·79	1045·46				
57	75	168·21	845·670				
58	76	140·40	677·460				
59	77	116·10	537·060				
60	78	94·996	420·960				

DIFFERENCE OF AGE, 78 YEARS.

10	88	120·49	382·444
11	99	85·916	261·954
12	90	60·040	176·038
13	91	41·100	115·998
14	92	27·533	74·8984
15	93	18·017	47 3654
16	94	11·525	29·3484
17	95	7·2012	17·8234
18	96	4·3966	10·6222
19	97	2·6268	6·22560
20	98	1·5380	3·59880
21	99	·89730	2·06080
22	100	·51985	1·16350
23	101	·28904	·64365
24	102	·16576	·35461
25	103	·09447	·18885
26	104	·05466	·09438
27	105	·03036	·03972
28	106	·00936	·00936

78 YEARS.

DIFFERENCE OF AGE, 19 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	29	23060	269180	61	80	65·438	267·686
11	30	21165	246120	62	81	51·654	202·248
12	31	19440	224955	63	82	40·184	150·594
13	32	17866	205515	64	83	30·792	110·410
14	33	16425	187649	65	84	23·218	79·6182
15	34	15101	171224	66	85	17·207	56·4002
16	35	13880	156123	67	86	12·511	39·1932
17	36	12750	142243	68	87	8·9129	26·6822
18	37	11705	129493	69	88	6·1941	17·7693
19	38	10638	117788	70	89	4·2148	11·5752
20	39	9843·4	107150	71	90	2·7962	7·36040
21	40	9021·0	97306·2	72	91	1·8069	4·56420
22	41	8260·8	88285·2	73	92	1·1362	2·75730
23	42	7559·8	80024·4	74	93	·69360	1·62110
24	43	6913·8	72464·6	75	94	·41133	·92750
25	44	6318·3	65550·8	76	95	·23663	·51617
26	45	5770·0	59232·5	77	96	·13203	·27954
27	46	5265·6	53462·5	78	97	·07147	·14751
28	47	4802·0	48196·9	79	98	·03756	·07604
29	48	4376·2	43394·9	80	99	·01946	·03848
30	49	3985·4	39018·7	81	100	·00990	·01902
31	50	3626·8	35033·3	82	101	·00478	·00912
32	51	3297·9	31406·5	83	102	·00235	·00434
33	52	2996·1	28108·6	84	103	·00113	·00199
34	53	2719·3	25112·5	85	104	·00055	·00086
35	54	2465·3	22393·3	86	105	·00025	·00031
36	55	2232·4	19927·9	87	106	·00006	·00006
37	56	2018·9	17695·5				
38	57	1823·2	15676·6				
39	58	1643·9	13853·4				
40	59	1479·8	12209·5				
41	60	1329·6	10729·7				
42	61	1192·2	9400·12				
43	62	1066·5	8207·92				
44	63	951·68	7141·42				
45	64	846·84	6189·74				
46	65	751·28	5342·90				
47	66	664·27	4591·62				
48	67	585·26	3927·35				
49	86	513·62	3342·09				
50	69	448·88	2828·47				
51	70	390·47	2379·59				
52	71	337·94	1989·12				
53	72	290·80	1651·18				
54	73	248·69	1360·38				
55	74	211·20	1111·69				
56	75	178·02	900·491				
57	76	148·79	722·471				
58	77	123·22	573·681				
59	78	100·97	450·461				
60	79	81·805	349·491				

DIFFERENCE OF AGE, 77 YEARS.

10	87	159·31	526·481
11	88	115·56	367·171
12	89	82·474	251·611
13	90	57·676	169·137
14	91	39·499	111·461
15	92	26·466	71·9623
16	93	17·317	45·4963
17	94	11·073	28·1793
18	95	6·9153	17·1063
19	96	4·2202	10·1910
20	97	2·5204	5·97079
21	98	1·4751	3·45039
22	99	·86038	1·97529
23	100	·49831	1·11491
24	101	·27698	·61660
25	102	·15879	·33962
26	103	·09047	·18083
27	104	·05234	·09036
28	105	·02906	·03802
29	106	·00896	·00896

77 YEARS.

Table 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

Difference of Age, 20 Years.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	y.			x.	y.		
10	30	22067	256748	61	81	55·106	217·224
11	31	20251	234681	62	82	42·959	162·118
12	32	18599	214430	63	83	32·997	119·159
13	33	17091	195831	64	84	24·945	86·1618
14	34	15710	178740	65	85	18·540	61·2168
15	35	14441	163030	66	86	13·521	42·6768
16	36	13271	148589	67	87	9·6650	29·1558
17	37	12188	135318	68	88	6·7407	19·4908
18	38	11187	123130	69	89	4·6052	12·7501
19	39	10261	111943	70	90	3·0683	8·14485
20	40	9405·2	101682	71	91	1·9925	5·07655
21	41	8615·3	92276·5	72	92	1·2595	3·08405
22	42	7886·6	83661·2	73	93	·77350	1·82455
23	43	7214·9	75774·6	74	94	·46163	1·05105
24	44	6595·6	68559·7	75	95	·26751	·58942
25	45	6025·0	61964·1	76	96	·15044	·32191
26	46	5499·6	55939·1	77	97	·08218	·17147
27	47	5016·5	50439·5	78	98	·04361	·08929
28	48	4572·4	45423·0	79	99	·02284	·04568
29	49	4164·6	40850 6	80	100	·01176	·02284
30	50	3790·4	36686·0	81	101	·00574	·01108
31	51	3447·1	32895·6	82	102	·00286	·00534
32	52	3132 0	29448·5	83	103	·00140	·00248
33	53	2843·1	26316·5	84	104	·00068	·00108
34	54	2578·0	23473·4	85	105	·00032	·00040
35	55	2334·8	20895·4	86	106	·00008	·00008
36	56	2111·9	18560·6				
37	57	1907·6	16448·7				
38	58	1720·4	14541·1				
39	59	1549·1	12820·7				
40	60	1392·2	11271·6				
41	61	1248·7	9879·36				
42	62	1117·5	8630·66				
43	63	997·59	7513·16				
44	64	888·07	6515·57				
45	65	788·22	5627·50				
46	66	697·26	4839·28				
47	67	614·66	4142·02				
48	68	539·72	3527·36				
49	69	471·97	2987·64				
50	70	410·82	2515·67				
51	71	355·83	2104·85				
52	72	306·45	1749·02				
53	73	262·32	1442·57				
54	74	223·00	1180·25				
55	75	188·19	957·251				
56	76	157·47	769·061				
57	77	130 58	611·591				
58	78	107·16	481·011				
59	79	86·953	373·851				
60	80	69·674	286·898				

Difference of Age, 76 Years.

10	86	206·23	711·732
11	87	152·80	505·502
12	88	110·93	352·702
13	89	79·227	241·772
14	90	55·430	162·545
15	91	37·967	107·115
16	92	25·436	69·1478
17	93	16·637	43·7118
18	94	10·663	27·0748
19	95	6·6379	16·4118
20	96	4·0493	9·77388
21	97	2·4174	5·72458
22	98	1·4144	3·30718
23	99	·82474	1·89278
24	100	·47752	1·06804
25	101	·26534	·59052
26	102	·15207	·32518
27	103	·08662	·17311
28	104	·05010	·08649
29	105	·02781	·03639
30	106	·00858	·00858

76 Years.

Difference of Age, 21 Years.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	y.			x.	y.		
10	31	21115	244710	61	82	45·830	174·058
11	32	19375	223595	62	83	35·276	128·228
12	33	17792	204220	63	84	26·731	92·9521
13	34	16347	186428	64	85	19·919	66·2211
14	35	15024	170081	65	86	14·568	46·3021
15	36	13808	155057	66	87	10·445	31·7341
16	37	12687	141249	67	88	7·3095	21·2891
17	38	11649	128562	68	89	5·0116	13·9796
18	39	10690	116913	69	90	3·3526	8·96799
19	40	9802·2	106223	70	91	2·1865	5·61539
20	41	8982·2	96420·8	71	92	1·3889	3·42889
21	42	8225·0	87438·6	72	93	·85746	2·03999
22	43	7526·7	79213·6	73	94	·51481	1·18253
23	44	6882·9	71686·9	74	95	·30022	·66772
24	45	6289·4	64804·0	75	96	·17008	·36750
25	46	5741·6	58514·6	76	97	·09364	·19742
26	47	5239·4	52773·0	77	98	·05015	·10378
27	48	4776·6	47533·6	78	99	·02653	·05363
28	49	4351·4	42757·0	79	100	·01380	·02710
29	50	3960·8	38405·6	80	101	·00682	·01330
30	51	3602·6	34444·8	81	102	·00344	·00648
31	52	3273·7	30842·2	82	103	·00170	·00304
32	53	2972·0	27568·5	83	104	·00084	·00134
33	54	2695·3	24596·5	84	105	·00040	·00050
34	55	2441·5	21901·2	85	106	·00010	·00010
35	56	2208·7	19459·7				
36	57	1995·5	17251·0				
37	58	1800·0	15255·5				
38	59	1621·1	13455·5				
39	60	1457·4	11834·4				
40	61	1307·5	10377·0				
41	62	1170·5	9069·50				
42	63	1045·3	7899·00				
43	64	930·91	6853·70				
44	65	826·60	5922·79				
45	66	731·55	5096·19				
46	67	645·18	4364·64				
47	68	566·82	3719·46				
48	69	495·95	3152·64				
49	70	431·96	2656·69				
50	71	374·38	2224·73				
51	72	322·68	1850·35				
52	73	276·44	1527·67				
53	74	235·23	1251·23				
54	75	198·71	1016·00				
55	76	166·46	817·288				
56	77	138·20	650·828				
57	78	113·56	512·628				
58	79	92·278	399·068				
59	80	74·059	306·790				
60	81	58·673	232·731				

Difference of Age, 75 Years.

10	85	262·45	945·753
11	86	197·79	683·303
12	87	146·68	485·513
13	88	106·56	338·833
14	89	76·141	232·273
15	90	53·280	156·132
16	91	36·491	102·852
17	92	24·438	66·3609
18	93	15·976	41·9229
19	94	10 207	25·9469
20	95	6·3690	15·7399
21	96	3·8839	9·37087
22	97	2·3180	5·48697
23	98	1·3558	3·16897
24	99	·79032	1·81317
25	100	·45744	1·02285
26	101	·25411	·56541
27	102	·14560	·31130
28	103	·08292	·16570
29	104	·04795	·08278
30	105	·02662	·03483
31	106	·00821	·00821

75 Years.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 22 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	32	20201	233146	61	83	37·634	137·627
11	33	18534	212945	62	84	28·578	99·9927
12	34	17017	194411	63	85	21·346	71·4147
13	35	15633	177394	64	86	15·652	50·0687
14	36	14365	161761	65	87	11·254	34·4167
15	37	13200	147396	66	88	7·8995	23·1627
16	38	12126	134196	67	89	5·4345	15·2632
17	39	11132	122070	68	90	3·6484	9·82874
18	40	10212	110938	69	91	2·3890	6·18034
19	41	9361·3	100726	70	92	1·5241	3·79134
20	42	8575·3	91364·4	71	93	·94556	2·26724
21	43	7849·7	82789·1	72	94	·57069	1·32168
22	44	7180·3	74939·4	73	95	·33481	·75099
23	45	6563·3	67759·1	74	96	·19087	·41618
24	46	5994·7	61195·8	75	97	·10586	·22531
25	47	5470·9	55201·1	76	98	·05714	·11945
26	48	4988·8	49730·2	77	99	·03050	·06231
27	49	4545·7	44741·4	78	100	·01603	·03181
28	50	4138·4	40195·7	79	101	·00801	·01578
29	51	3764·6	36057·3	80	102	·00408	·00777
30	52	3421·4	32292·7	81	103	·00204	·00369
31	53	3106·5	28871·3	82	104	·00103	·00165
32	54	2817·6	25764·8	83	105	·00049	·00062
33	55	2552·6	22947·2	84	106	·00013	·00013
34	56	2309·6	20394·6				
35	57	2087·0	18085·0				
36	58	1882·9	15998·0				
37	59	1696·1	14115·1				
38	60	1525·1	12419·0				
39	61	1368·8	10893·9				
40	62	1225·6	9525·14				
41	63	1094·9	8299·54				
42	64	975·42	7204·64				
43	65	866·47	6229·22				
44	66	767·16	5362·75				
45	67	676·91	4595·59				
46	68	594·98	3918·68				
47	69	520·86	3323·70				
48	70	453·91	2802·84				
49	71	393·64	2348·93				
50	72	339·50	1955·29				
51	73	291·08	1615·79				
52	74	247·89	1324·71				
53	75	209·60	1076·82				
54	76	175·76	867·219				
55	77	146·09	691·459				
56	78	120·19	545·369				
57	79	97·795	425·179				
58	80	78·594	327·384				
59	81	62·366	248·790				
60	82	48·797	186·424				

DIFFERENCE OF AGE, 74 YEARS.

10	84	328·67	1236·92
11	85	251·72	908·248
12	86	189·87	656·528
13	87	140·90	466·658
14	88	102·41	325·758
15	89	73·198	223·348
16	90	51·209	150·150
17	91	35·058	98·9410
18	92	23·468	63·8830
19	93	15·335	40·4150
20	94	9·7933	25·0800
21	95	6·1089	15·2867
22	96	3·7241	9·17775
23	97	2·2219	5·45365
24	98	1·2993	3·23175
25	99	·95312	1·93245
26	100	·43808	·97933
27	101	·24330	·54125
28	102	·13938	·29795
29	103	·07936	·15857
30	104	·04589	·07921
31	105	·02547	·03332
32	106	·00785	·00785

74 YEARS.

DIFFERENCE OF AGE, 23 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	33	19324	222033	61	84	30·488	107·284
11	34	17727	202709	62	85	22·820	76·7962
12	35	16274	184982	63	86	16·773	53·9762
13	36	14947	168708	64	87	12·091	37·2032
14	37	13732	153761	65	88	8·5116	25·1122
15	38	12616	140029	66	89	5·8732	16·6006
16	39	11587	127413	67	90	3·9563	10·7274
17	40	10634	115826	68	91	2·5998	6·77114
18	41	9752·5	105192	69	92	1·6653	4·17134
19	42	8937·3	95439·3	70	93	1·0376	2·50604
20	43	8184·0	86502·0	71	94	·62932	1·46844
21	44	7488·5	78318·0	72	95	·37115	·83912
22	45	6847·0	70829·5	73	96	·21286	·46797
23	46	6255·7	63982·5	74	97	·11880	·25511
24	47	5711·0	57726·8	75	98	·06460	·13631
25	48	5209·3	52015·8	76	99	·03476	·07171
26	49	4747·6	46806·5	77	100	·01843	·03695
27	50	4323·2	42058·9	78	101	·00930	·01852
28	51	3933·4	37735·7	79	102	·00479	·00922
29	52	3575·2	33802·3	80	103	·00243	·00443
30	53	3246·6	30227·1	81	104	·00124	·00200
31	54	2945·1	26980·5	82	105	·00060	·00076
32	55	2668·4	24035·4	83	106	·00016	·00016
33	56	2414·7	21367·0				
34	57	2182·3	18952·3				
35	58	1969·3	16770·0				
36	59	1774·2	14800·7				
37	60	1595·7	13026·5				
38	61	1432·4	11430·8				
39	62	1283·0	9998·45				
40	63	1146·5	8715·45				
41	64	1021·7	7568·95				
42	65	907·90	6547·25				
43	66	804·17	5639·35				
44	67	709·86	4835·18				
45	68	624·23	4125·32				
46	69	546·73	3501·09				
47	70	476·70	2954·36				
48	71	413·64	2477·66				
49	72	356·97	2064·02				
50	73	306·26	1707·05				
51	74	261·01	1400·79				
52	75	220·88	1139·78				
53	76	185·40	918·899				
54	77	154·25	733·499				
55	78	127·05	579·249				
56	79	103·50	452·199				
57	80	83·292	348·699				
58	81	66·185	265·407				
59	82	51·868	199·222				
60	83	40·070	147·354				

DIFFERENCE OF AGE, 73 YEARS.

10	83	405·71	1593·11
11	84	315·22	1187·40
12	85	241·63	872·183
13	86	182·39	630·553
14	87	135·41	448·163
15	88	98·439	312·753
16	89	70·343	214·314
17	90	49·198	143·971
18	91	33·666	94·7728
19	92	22·526	61·1068
20	93	14·714	38·5808
21	94	9·3932	23·8668
22	95	5·8575	14·4736
23	96	3·5698	8·61613
24	97	2·1292	5·04633
25	98	1·2446	2·91713
26	99	·72505	1·67253
27	100	·41945	·94748
28	101	·23290	·52803
29	102	·13340	·29513
30	103	·07594	·16173
31	104	·04391	·08579
32	105	·03437	·04188
33	106	·00751	·00751

73 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 24 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	34	18483	211256	61	85	24·345	82·3690
11	35	16952	192773	62	86	17·931	58·0240
12	36	15560	175821	63	87	12·957	40·0930
13	37	14289	160231	64	88	9·1445	27·1360
14	38	13125	145972	65	89	6·3282	17·9915
15	39	12055	132847	66	90	4·2756	11·6633
16	40	11069	120792	67	91	2·8192	7·38769
17	41	10155	109723	68	92	1·8122	4·56849
18	42	9310·8	99567·8	69	93	1·1337	2·75629
19	43	8529·4	90257·0	70	94	·69058	1·62259
20	44	7807·4	81727·6	71	95	·40928	·93201
21	45	7140·8	73920·2	72	96	·23597	·52273
22	46	6526·1	66779·4	73	97	·13249	·28676
23	47	5959·7	60253·3	74	98	·07250	·15427
24	48	5437·9	54293·6	75	99	·03929	·08177
25	49	4957·4	48855·7	76	100	·02100	·04248
26	50	4515·3	43898·3	77	101	·01069	·02148
27	51	4109·0	39383·0	78	102	·00556	·01079
28	52	3735·6	35274·0	79	103	·00285	·00523
29	53	3392 6	31538·4	80	104	·00147	·00238
30	54	3077·9	28145·8	81	105	·00072	·00091
31	55	2689·1	25067·9	82	106	·00019	·00019
32	56	2524·3	22378·8				
33	57	2281·7	19854·5				
34	58	2059·2	17572·8				
35	59	1855·6	15513·6				
36	60	1669·2	13658·0				
37	61	1498·7	11988·8				
38	62	1342·7	10490·1				
39	63	1200·1	9147·37				
40	64	1069·8	7947·27				
41	65	950·98	6877·47				
42	66	842·62	5926·49				
43	67	744·10	5083·87				
44	68	654·62	4339·77				
45	69	573·61	3685·15				
46	70	500·38	3111·54				
47	71	434·42	2611·16				
48	72	375·11	2176·74				
49	73	322·02	1801·63				
50	74	274·62	1479·61				
51	75	232·58	1204·99				
52	76	195·38	972·409				
53	77	162·71	777·029				
54	78	134·15	614·319				
55	79	109·41	480·169				
56	80	88·151	370·759				
57	81	70·141	282·608				
58	82	55·045	212·467				
59	83	42·592	157·422				
60	84	32·461	114·830				

DIFFERENCE OF AGE, 72 YEARS.

10	82	494·07	2023·69
11	83	389·11	1529·62
12	84	302·59	1140·51
13	85	232·12	837·916
14	86	175·29	605·796
15	87	130·16	430·506
16	88	94·612	300·346
17	89	67·580	205·734
18	90	47·245	138·154
19	91	32·316	90·9086
20	92	21·614	58·5926
21	93	14·113	36·9786
22	94	9·0067	22·8656
23	95	5·6149	13·8589
24	96	3·4208	8·24395
25	97	2·0397	4·82315
26	98	1·1920	2·78345
27	99	·69420	1·59145
28	100	·40152	·89725
29	101	·22290	·49573
30	102	·12766	·27283
31	103	·07267	·14517
32	104	·04201	·07250
33	105	·02331	·03049
34	106	·00718	·00718

72 YEARS.

DIFFERENCE OF AGE, 25 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	35	17675	201098	61	86	19·130	62·2171
11	36	16209	183423	62	87	13·852	43·0871
12	37	14875	167214	63	88	9·7995	29·2351
13	38	13657	152339	64	89	6·7988	19·4356
14	39	12542	138682	65	90	4·6069	12·6368
15	40	11516	126140	66	91	3·0468	8·02993
16	41	10571	114624	67	92	1·9652	4·98313
17	42	9695·6	104053	68	93	1·2338	3·01793
18	43	8885·9	94357·3	69	94	·75455	1·78413
19	44	8137·0	85471·4	70	95	·44912	1·02958
20	45	7444·9	77334·4	71	96	·26021	·58046
21	46	6806·2	69889·5	72	97	·14687	·32025
22	47	6217·3	63083·3	73	98	·08085	·17338
23	48	5674·7	56866·0	74	99	·04410	·09253
24	49	5175·0	51191·3	75	100	·02374	·04843
25	50	4714·9	46016·3	76	101	·01218	·02469
26	51	4291·6	41301·4	77	102	·00640	·01251
27	52	3902·4	37009·8	78	103	·00331	·00611
28	53	3544·7	33107·4	79	104	·00172	·00280
29	54	3216·3	29562·7	80	105	·00085	·00108
30	55	2914·9	26346·4	81	106	·00023	·00023
31	56	2638·5	23431·5				
32	57	2385·2	20793·0				
33	58	2153·0	1840·78				
34	59	1940·4	16254·8				
35	60	1745·8	14314·4				
36	61	1567·7	12568·6				
37	62	1404·8	11000·9				
38	63	1255·9	9596·15				
39	64	1119·9	8340·25				
40	65	995·77	7220·35				
41	66	882·60	6224·58				
42	67	779·68	5341·98				
43	68	686·20	4562·30				
44	69	601·54	3876·10				
45	70	524·98	3274·56				
46	71	455·99	2749·58				
47	72	393·94	2293·59				
48	73	338·38	1899·65				
49	74	288·75	1561·27				
50	75	244·70	1272·52				
51	76	205·73	1027·82				
52	77	171·47	822·085				
53	78	141·50	650·615				
54	79	115·52	509·115				
55	80	93·184	393·595				
56	81	74·233	300·411				
57	82	58·335	226·178				
58	83	45·200	167·843				
59	84	34·504	122·643				
60	85	25·922	88·1391				

DIFFERENCE OF AGE, 71 YEARS.

10	81	594·06	2537·11
11	82	473·86	1943·05
12	83	373·52	1469·19
13	84	290·68	1095·67
14	85	223·08	804·995
15	86	168·49	581·915
16	87	125·10	413·425
17	88	90·897	288·325
18	89	64·898	197·428
19	90	45·350	132·530
20	91	31·007	87·1799
21	92	20·731	56·1729
22	93	13·533	35·4419
23	94	8·6336	21·9089
24	95	5·3805	13·2753
25	96	3·2770	7·89484
26	97	1·9534	4·61784
27	98	1·1413	2·66444
28	99	·66453	1·52314
29	100	·38429	·85861
30	101	·21331	·47432
31	102	·12215	·26101
32	103	·06952	·13886
33	104	·04018	·06934
34	105	·02229	·02916
35	106	·00687	·00687

71 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, **26** YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	36	16900	191238	61	87	14·778	46·1868
11	37	15495	174338	62	88	10·476	31·4088
12	38	14217	158843	63	89	7·2858	20·9328
13	39	13050	144626	64	90	4·9495	13·6470
14	40	11981	131576	65	91	3·2829	8·69752
15	41	10998	119595	66	92	2·1238	5·41462
16	42	10092	108597	67	93	1·3379	3·29082
17	43	9253·2	98505·3	68	94	·82113	1·95292
18	44	8477·0	89252·1	69	95	·49072	1·13179
19	45	7759·2	80775·1	70	96	·28554	·64107
20	46	7096·0	73015·9	71	97	·16196	·35553
21	47	6484·1	65919·9	72	98	·08962	·19357
22	48	5920·0	59435·8	73	99	·04918	·10395
23	49	5400·4	53515·8	74	100	·02664	·05477
24	50	4921·8	48115·4	75	101	·01377	·02813
25	51	4481·2	43193·6	76	102	·00729	·01436
26	52	4075·8	38712·4	77	103	·00381	·00707
27	53	3703·0	34636·6	78	104	·00200	·00326
28	54	3360·5	30933·6	79	105	·00099	·00126
29	55	3046·0	27573·1	80	106	·00027	·00027
30	56	2757·5	24527·1				
31	57	2493·1	21769·6				
32	58	2250·6	19276·5				
33	59	2028·7	17025·9				
34	60	1825·5	14997·2				
35	61	1639·6	13171·7				
36	62	1469·5	11532·1				
37	63	1314·0	10062·6				
38	64	1172·0	8748·57				
39	65	1042·4	7576·57				
40	66	9241·7	6534·17				
41	67	816·68	5610·00				
42	68	719·01	4793·32				
43	69	630·56	4074·31				
44	70	550·54	3443·75				
45	71	478·41	2893·21				
46	72	413·51	2414·80				
47	73	355·37	2001·29				
48	74	303·42	1645·92				
49	75	257·29	1342·50				
50	76	216·45	1085·21				
51	77	180·55	868·759				
52	78	149·12	688·209				
53	79	121·86	539·089				
54	80	98·393	417·229				
55	81	78·471	318·836				
56	82	61·738	240·365				
57	83	47·902	178·627				
58	84	36·617	130·725				
59	85	27·553	94·1078				
60	86	20·368	66·5548				

DIFFERENCE OF AGE, **70** YEARS.

10	80	705·44	3141·50				
11	81	569·76	2436·06				
12	82	454·87	1866·30				
13	83	358·82	1411·43				
14	84	279·36	1052·61				
15	85	214·43	773·249				
16	86	161·94	558·819				
17	87	120·19	396·879				
18	88	87·288	276·689				
19	89	62·294	189·401				
20	90	43·513	127·107				
21	91	29·741	83·5945				
22	92	19·878	53·8535				
23	93	12·972	33·9755				
24	94	8·2733	21·0035				
25	95	5·1543	12·7302				
26	96	3·1383	7·57586				
27	97	1·8703	4·43756				
28	98	1·0925	2·56726				
29	99	·63601	1·47476				
30	100	·36775	·83875				
31	101	·20410	·47100				
32	102	·11686	·26690				
33	103	·08372	·15004				
34	104	·03843	·06632				
35	105	·02132	·02789				
36	106	·00657	·00657				

70 YEARS.

DIFFERENCE OF AGE, **27** YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	37	16156	181765	61	88	11·177	33·6602
11	38	14810	165609	62	89	7·7890	22·4832
12	39	13585	150799	63	90	5·3040	14·6942
13	40	12467	137214	64	91	3·5270	9·39023
14	41	11442	124747	65	92	2·2883	5·86323
15	42	10500	113305	66	93	1·4459	3·57493
16	43	9631·5	102805	67	94	·89042	2·12903
17	44	8827·4	93173·8	68	95	·53402	1·23861
18	45	8083·4	84346·4	69	96	·31199	·70459
19	46	7395·5	76263·0	70	97	·17773	·39260
20	47	6760·2	68867·5	71	98	·09883	·21487
21	48	6174·0	62107·3	72	99	·05452	·11604
22	49	5633·8	55933·3	73	100	·02971	·06152
23	50	5136·1	50299·5	74	101	·01545	·03181
24	51	4677·9	45163·4	75	102	·00824	·01636
25	52	4255·9	40485·5	76	103	·00434	·00812
26	53	3867·6	36229·6	77	104	·00230	·00378
27	54	3510·6	32362·0	78	105	·00116	·00148
28	55	3182·6	28851·4	79	106	·00032	·00032
29	56	2881·5	25668·8				
30	57	2605·5	22787·3				
31	58	2352·5	20181·8				
32	59	2120·8	17829·3				
33	60	1908·6	15708·5				
34	61	1714·5	13799·9				
35	62	1537·9	12085·4				
36	63	1374·6	10547·5				
37	64	1226·2	9172·88				
38	65	1090·9	7946·68				
39	66	967·42	6855·78				
40	67	855·14	5888·36				
41	68	753·13	5033·22				
42	69	660·71	4280·09				
43	70	577·10	3619·38				
44	71	501·71	3042·28				
45	72	433·84	2540·57				
46	73	373·02	2106·73				
47	74	318·66	1733·71				
48	75	270·36	1415·05				
49	76	227·59	1144·69				
50	77	189·96	917·099				
51	78	157·02	727·139				
52	79	128·42	570·119				
53	80	103·79	441·699				
54	81	82·858	337·909				
55	82	65·263	255·051				
56	83	50·697	189·788				
57	84	38·806	139·091				
58	85	29 240	100·285				
59	86	21·650	71·0452				
60	87	15·735	49·3952				

DIFFERENCE OF AGE, **69** YEARS.

10	79	828·27	3844·58				
11	80	676·58	3016·31				
12	81	546·93	2339·73				
13	82	436·96	1792·80				
14	83	344·84	1355·84				
15	84	268·52	1011·00				
16	85	206·09	742·481				
17	86	155·58	536·391				
18	87	115·42	380·811				
19	88	83·786	265·391				
20	89	59·771	181·605				
21	90	41·735	121·834				
22	91	28·517	80·0990				
23	92	19·054	51·5820				
24	93	12·431	32·5280				
25	94	7·9255	20·0970				
26	95	4·9362	12·1715				
27	96	3·0048	7·23530				
28	97	1·7903	4·23050				
29	98	1·0456	2·44020				
30	99	·60864	1·39460				
31	100	·35188	·78596				
32	101	·19527	·43408				
33	102	·11179	·23881				
34	103	·06361	·12702				
35	104	·03675	·06341				
36	105	·02038	·02666				
37	106	·00628	·00628				

69 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 28 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	38	15442	172659	61	89	8·3096	24·0882
11	39	14152	157217	62	90	5·6703	15·7786
12	40	12978	143065	63	91	3·7796	10·1083
13	41	11906	130087	64	92	2·4585	6·32872
14	42	10924	118181	65	93	1·5579	3·87022
15	43	10021	107257	66	94	·96230	2·31232
16	44	9188·2	97235·7	67	95	·57909	1·35002
17	45	8417·5	88047·5	68	96	·33952	·77093
18	46	7704·6	79630·0	69	97	·19419	·43141
19	47	7045·6	71925·4	70	98	·10845	·23722
20	48	6437·0	64879·8	71	99	·06012	·12877
21	49	5875·5	58442·8	72	100	·03294	·06865
22	50	5358·1	52567·3	73	101	·01724	·03571
23	51	4881·6	47209·2	74	102	·00925	·01847
24	52	4442·6	42327·6	75	103	·00490	·00922
25	53	4038·5	37885·0	76	104	·00262	·00432
26	54	3666·6	33846·5	77	105	·00133	·00170
27	55	3324·7	30179·9	78	106	·00037	·00037
28	56	3010·7	26855·2				
29	57	2722·7	23844·5				
30	58	2458·6	21121·8				
31	59	2216·7	18663·2				
32	60	1995·3	16446·5				
33	61	1792·6	14451·2				
34	62	1607·1	12658·6				
35	63	1437·6	11051·5				
36	64	1282·7	9613·92				
37	65	1141·3	8331·22				
38	66	1012·4	7189·92				
39	67	895·17	6177·52				
40	68	788·60	5282·35				
41	69	692·06	4493·75				
42	70	604·69	3801·69				
43	71	525·91	3197·00				
44	72	454·96	2671·09				
45	73	391·36	2216·13				
46	74	334·49	1824·77				
47	75	283·94	1490·28				
48	76	239·15	1206·34				
49	77	199·74	967·187				
50	78	165·21	767·447				
51	79	135·22	602·237				
52	80	109·37	467·017				
53	81	87·399	357·647				
54	82	68·911	270·248				
55	83	53·591	201·337				
56	84	41·070	147·746				
57	85	30·988	106·676				
58	86	22·975	75·6882				
59	87	16·725	52·7132				
60	88	11·900	35·9882				

DIFFERENCE OF AGE, 68 YEARS.

10	78	961·82	4653·19
11	79	794·38	3691·37
12	80	649·48	2896·99
13	81	525·40	2247·51
14	82	419·94	1722·11
15	83	331·47	1302·17
16	84	258·03	970·704
17	85	198·00	712·674
18	86	149·40	514·674
19	87	110·79	365·274
20	88	80·393	254·484
21	89	57·330	174·091
22	90	40·018	116·761
23	91	27·335	76·7429
24	92	18·259	49·4079
25	93	11·908	31·1489
26	94	7·5900	19·2409
27	95	4·7262	11·6509
28	96	2·8764	6·92470
29	97	1·7135	4·04830
30	98	1·0006	2·33480
31	99	·58237	1·33420
32	100	·33665	·75183
33	101	·18680	·41518
34	102	·10692	·22838
35	103	·06083	·12146
36	104	·03514	·06063
37	105	·01949	·02549
38	106	·00600	·00600

68 YEARS.

DIFFERENCE OF AGE, 29 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	39	14756	163905	61	90	6·0493	16·9012
11	40	13519	149149	62	91	4·0407	10·8519
12	41	12394	135630	63	92	2·6346	6·81115
13	42	11367	123236	64	93	1·6737	4·17655
14	43	10425	111869	65	94	1·0369	2·50285
15	44	9559·9	101444	66	95	·62583	1·46595
16	45	8761·6	91884·0	67	96	·36817	·84012
17	46	8023·1	83122·4	68	97	·21133	·47195
18	47	7340·0	75099·3	69	98	·11850	·26062
19	48	6708·7	67759·3	70	99	·06597	·14212
20	49	6125·7	61050·6	71	100	·03632	.07615
21	50	5588·0	54924·9	72	101	·01911	·03983
22	51	5092·6	49336·9	73	102	·01031	·02072
23	52	4636·1	44244·3	74	103	·00550	·01041
24	53	4215·7	39608·2	75	104	·00296	·00491
25	54	3828·6	35392·5	76	105	·00152	·00195
26	55	3472·5	31563·9	77	106	·00043	·00043
27	56	3145·2	28091·4				
28	57	2844·8	24946·2				
29	58	2569·1	22101·4				
30	59	2316·7	19532·3				
31	60	2085·5	17215·6				
32	61	1873·9	15130·1				
33	62	1680·3	13256·2				
34	63	1503·3	11575·9				
35	64	1341·5	10072·6				
36	65	1193·9	8731·15				
37	66	1059·3	7537·25				
38	67	936·80	6477·95				
39	68	825·51	5541·15				
40	69	724·65	4715·64				
41	70	633·38	3990·99				
42	71	551·05	3357·61				
43	72	476·91	2806·56				
44	73	410·42	2329·65				
45	74	350·93	1919·23				
46	75	298·04	1568·30				
47	76	251·16	1270·26				
48	77	209·88	1019·10				
49	78	173·70	809·216				
50	79	142·27	635·516				
51	80	115·16	493·246				
52	81	92·104	378·086				
53	82	72·688	285·982				
54	83	56·587	213·294				
55	84	43·414	156·707				
56	85	32·796	113·293				
57	86	24·350	80·4968				
58	87	17·749	56·1468				
59	88	12·649	38·3978				
60	89	8·8476	25·7488				

DIFFERENCE OF AGE, 67 YEARS.

10	77	1105·9	5573·76
11	78	922·47	4467·86
12	79	762·56	3545·39
13	80	623·90	2782·83
14	81	504·93	2158·93
15	82	403·66	1654·00
16	83	318·58	1250·34
17	84	247·95	931·759
18	85	190·14	683·809
19	86	143·41	493·669
20	87	106·30	350·259
21	88	77·109	243·959
22	89	54·971	166·850
23	90	38·360	111·879
24	91	26·195	73·5187
25	92	17·492	47·3237
26	93	11·404	29·8317
27	94	7·2672	18·4277
28	95	4·5242	11·1605
29	96	2·7529	6·63625
30	97	1·6397	3·88335
31	98	·95741	2·24365
32	99	·55717	1·28624
33	100	·32204	·72907
34	101	·17866	·40703
35	102	·11225	·22837
36	103	·05816	·11612
37	104	·03360	·05796
38	105	·01862	·02436
39	106	·00574	·00574

67 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 30 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	40	14096	155491	61	91	4·3107	11·6213
11	41	12911	141395	62	92	2·8166	7·31063
12	42	11833	128484	63	93	1·7936	4·49403
13	43	10848	116651	64	94	1·1140	2·70043
14	44	9945·6	105803	65	95	·67432	1·58643
15	45	9116·1	95857·5	66	96	·39789	·91211
16	46	8351·1	86741·4	67	97	·22916	·51422
17	47	7643·4	78390·3	68	98	·12895	·28506
18	48	6989·1	70746·9	69	99	·07208	·15611
19	49	6384·3	63757·8	70	100	·03986	·08403
20	50	5826·0	57373·5	71	101	·02107	·04417
21	51	5311·1	51547·5	72	102	·01143	·02310
22	52	4836·5	46236·4	73	103	·00614	·01167
23	53	4399·3	41399·9	74	104	·00332	·00553
24	54	3996·6	37000·6	75	105	·00172	·00221
25	55	3625·9	33004·0	76	106	·00049	·00049
26	56	3284·9	29378·1				
27	57	2971·8	26093·2				
28	58	2684·3	23121·4				
29	59	2420·9	20437·1				
30	60	2179·5	18016·2				
31	61	1958·7	15836·7				
32	62	1756·5	13878·0				
33	63	1571·7	12121·5				
34	64	1402·8	10549·8				
35	65	1248·7	9146·96				
36	66	1108·0	7898·26				
37	67	980·15	6790·26				
38	68	863·90	5810·11				
39	69	758·57	4946·21				
40	70	663·21	4187·64				
41	71	577·20	3524·43				
42	72	499·71	2947·23				
43	73	430·21	2447·52				
44	74	368·02	2017·31				
45	75	312·70	1649·29				
46	76	263·63	1336·59				
47	77	220·42	1072·96				
48	78	182·53	852 541				
49	79	149·59	670·011				
50	80	121·17	520·421				
51	81	96·981	399·251				
52	82	76·601	302·270				
53	83	59·689	225·669				
54	84	45·841	165·980				
55	85	34·668	120·139				
56	86	25·770	85·4705				
57	87	18·810	59·7005				
58	88	13·424	40·8905				
59	89	9·4043	27·4665				
60	90	6·4409	18·0622				

DIFFERENCE OF AGE, 66 YEARS.

10	76	1260·2	6611·90
11	77	1060·7	5351·70
12	78	885·52	4291·00
13	79	732·53	3405·48
14	80	599·60	2672·95
15	81	485·35	2073·35
16	82	387·97	1588·00
17	83	306·07	1200·03
18	84	238·11	893·959
19	85	182·51	655·849
20	86	137·60	473·339
21	87	101·96	335·739
22	88	73·937	233·779
23	89	52·693	159·842
24	90	36·759	107·149
25	91	25·093	70·3896
26	92	16·751	45·2966
27	93	10·919	28·5456
28	94	6·9565	17·6266
29	95	4·3300	10·6701
30	96	2·6345	6·34009
31	97	1·5690	3·70559
32	98	·91597	2·13659
33	99	·53299	1·22062
34	100	·30801	·68763
35	101	·17086	·37962
36	102	·09777	·20876
37	103	·05560	·11099
38	104	·03211	·05539
39	105	·01780	·02328
40	106	·00548	·00548

66 YEARS.

DIFFERENCE OF AGE, 31 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	41	13462	147404	61	92	3·0048	7·82748
11	42	12326	133942	62	93	1·9175	4·82268
12	43	11293	121616	63	94	1·1938	2·90518
13	44	10349	110323	64	95	·72446	1·71138
14	45	9483·8	99974·3	65	96	·42872	·98692
15	46	8688·9	90490·5	66	97	·24766	·55820
16	47	7955·9	81801·6	67	98	·13983	·31054
17	48	7277·9	73845·7	68	99	·07844	·17071
18	49	6651·1	66567·8	69	100	·04355	·09227
19	50	6071·9	59916·7	70	101	·02312	·04872
20	51	5537·3	53844·8	71	102	·01261	·02560
21	52	5044·0	48307·5	72	103	·00680	·01299
22	53	4589·4	43263·5	73	104	·00371	·00619
23	54	4170·7	38674·1	74	105	·00193	·00248
24	55	3785·0	34503·4	75	106	·00055	·00055
25	56	3430·1	30718·4				
26	57	3103·9	27288·3				
27	58	2804·2	24184·4				
28	59	2529·4	21380·2				
29	60	2277·5	18850·8				
30	61	2047·0	16573·3				
31	62	1837·0	14526·3				
32	63	1643·0	12689·3				
33	64	1466·7	11046·3				
34	65	1305·7	9579·59				
35	66	1158·9	8273·89				
36	67	1025·3	7114·99				
37	68	903·87	6089·69				
38	69	793·85	5185·82				
39	70	694·26	4391·97				
40	71	604·38	3697·71				
41	72	523·42	3093·33				
42	73	450·78	2569·91				
43	74	385·77	2119·13				
44	75	327 92	1733·36				
45	76	276·60	1405·44				
46	77	231·37	1128·84				
47	78	191·70	897·467				
48	79	157·19	705·767				
49	80	127·40	548·577				
50	81	102·04	421·177				
51	82	80·657	319·137				
52	83	62·901	238·480				
53	84	48·354	175·579				
54	85	36·606	127·225				
55	86	27·241	90·6189				
56	87	19·908	63·3779				
57	88	14·226	43·4699				
58	89	9·9803	29·2439				
59	90	6·8463	19·2636				
60	91	4·5898	12·4173				

DIFFERENCE OF AGE, 65 YEARS.

10	75	1424·7	7770·01
11	76	1205·6	6345·31
12	77	1018·2	5139·71
13	78	850·65	4121·51
14	79	704·00	3270·86
15	80	576·35	2566·86
16	81	466·48	1990·51
17	82	372·73	1524·03
18	83	293·92	1151·30
19	84	228·55	857·381
20	85	175·12	628·831
21	86	131·98	453·711
22	87	97·762	321·731
23	88	70·873	223·969
24	89	50·494	153·096
25	90	35·214	102·602
26	91	24·031	67·3880
27	92	16·039	43·3570
28	93	10·452	27·3180
29	94	6·6580	16·8660
30	95	4·1437	10·2080
31	96	2·5208	6·06432
32	97	1·5011	3·54352
33	98	·87621	2·04242
34	99	·50978	1·16621
35	100	·29456	·65643
36	101	·16336	·36187
37	102	·09246	·19851
38	103	·05314	·10605
39	104	·03068	·05291
40	105	·01700	·02223
41	106	·00523	·00523

65 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 32 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	42	12852	139629	61	93	2·0457	5·16274
11	43	11764	126777	62	94	1·2762	3·11704
12	44	10773	115013	63	95	·77636	1·84084
13	45	9868·2	104240	64	96	·46060	1·06448
14	46	9039·4	94372·0	65	97	·26684	·60388
15	47	8277·7	85332·6	66	98	·15112	·33704
16	48	7575·5	77054·9	67	99	·08506	·18592
17	49	6926·1	69479·4	68	100	·04739	·10086
18	50	6325·7	62553·3	69	101	·02526	·05347
19	51	5771·0	56227·6	70	102	·01383	·02821
20	52	5258·8	50456·6	71	103	·00750	·01438
21	53	4786·4	45197·8	72	104	·00411	·00688
22	54	4351·0	40411·4	73	105	·00215	·00277
23	55	3949·9	36060·4	74	106	·00062	·00062
24	56	3580·6	32110·5				
25	57	3241·0	28529·9				
26	58	2928·8	25288·9				
27	59	2642·4	22360·1				
28	60	2379·7	19717·7				
29	61	2139·1	17338·0				
30	62	1918·8	15198·9				
31	63	1717·3	13280·1				
32	64	1533·2	11562·8				
33	65	1365·1	10029·6				
34	66	1211·8	8664·50				
35	67	1072·3	7452·70				
36	68	945·50	6380·40				
37	69	830·58	5434·90				
38	70	726·55	4604·32				
39	71	632·67	3877·77				
40	72	548·08	3245·10				
41	73	472·17	2697·02				
42	74	404·22	2224·85				
43	75	343·74	1820·63				
44	76	290·06	1476·89				
45	77	242·75	1186·83				
46	78	201·22	944·083				
47	79	165·08	742·863				
48	80	133·88	577·783				
49	81	107·29	443·903				
50	82	84·863	336·613				
51	83	66·233	251·750				
52	84	50·957	185·517				
53	85	38·613	134·560				
54	86	28·764	95·9473				
55	87	21·044	67·1833				
56	88	15·056	46·1393				
57	89	10·577	31·0833				
58	90	7·2656	20·5063				
59	91	4·8786	13·2407				
60	92	3·1994	8·36214				

DIFFERENCE OF AGE, 64 YEARS.

10	74	1598·8	9061·95
11	75	1366·4	7463 15
12	76	1160 2	6096·75
13	77	978·12	4936·55
14	78	817·52	3958·43
15	79	676·70	3140·91
16	80	553·95	2464·21
17	81	448·16	1910·26
18	82	357·93	1462·10
19	83	282·13	1104·17
20	84	219·30	822·036
21	85	167·96	602·736
22	86	126·55	434·777
23	87	93·712	308·227
24	88	67·916	214·515
25	89	48·371	146·599
26	90	33·724	98·2278
27	91	23·009	64·5038
28	92	15·353	41·4948
29	93	10·004	26·1418
30	94	6·3714	16·1378
31	95	3·9648	9·76644
32	96	2·4117	5·80164
33	97	1·4359	3·38994
34	98	·83806	1·95404
35	99	·48751	1·11598
36	100	·28164	·62847
37	101	·15617	·34683
38	102	·08933	·19066
39	103	·05078	·10133
40	104	·02931	·05055
41	105	·01624	·02124
42	106	·00500	·00500

64 YEARS.

DIFFERENCE OF AGE, 33 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	43	12265	132157	61	94	1·3615	3·33634
11	44	11222	119892	62	95	·82998	1·97484
12	45	10273	108670	63	96	·49359	1·14486
13	46	9405·7	98396·6	64	97	·28669	·65127
14	47	8611·6	88990·9	65	98	·16283	·36458
15	48	7881·9	80379·3	66	99	·09192	·20175
16	49	7209·2	72497·4	67	100	·05139	·10983
17	50	6587·2	65288·2	68	101	·02749	·05844
18	51	6012·2	58701·0	69	102	·01512	·03095
19	52	5480·8	52688·8	70	103	·00823	·01583
20	53	4990·2	47208·0	71	104	·00453	·00760
21	54	4537·7	42217·8	72	105	·00238	·00307
22	55	4120·6	37680·1	73	106	·00069	·00069
23	56	3736·6	33559·5				
24	57	3383·3	29822·9				
25	58	3058·2	26439·6				
26	59	2759·8	23381·4				
27	60	2485·9	20621·6				
28	61	2235·0	18135·7				
29	62	2005·1	15900·7				
30	63	1794·8	13895·6				
31	64	1602·6	12100·8				
32	65	1427·1	10498·2				
33	66	1267·0	9071·05				
34	67	1121·3	7804·05				
35	68	988·86	6682·75				
36	69	868·83	5693·89				
37	70	760·16	4825·06				
38	71	662·10	4064·90				
39	72	573·73	3402·80				
40	73	494·41	2829·07				
41	74	423·40	2334·66				
42	75	360·18	1911·26				
43	76	304·06	1551·08				
44	77	254·57	1247·02				
45	78	211·11	992·454				
46	79	173·28	781·344				
47	80	140·60	608·064				
48	81	112·74	467·464				
49	82	89·229	354·724				
50	83	69·686	265·495				
51	84	53·655	195·809				
52	85	40·691	142·154				
53	86	30·341	101·463				
54	87	22·221	71·1224				
55	88	15·915	48·9014				
56	89	11·194	32·9864				
57	90	7·6999	21·7924				
58	91	5·1774	14·0925				
59	92	3·4007	8·91514				
60	93	2·1781	5·51444				

DIFFERENCE OF AGE, 63 YEARS.

10	73	1783·0	10483·4
11	74	1533·4	8700·36
12	75	1311·6	7166·96
13	76	1114·5	5855·36
14	77	940·02	4740·86
15	78	785·81	3800·84
16	79	650·29	3015·03
17	80	532·19	2364·74
18	81	430·37	1832·55
19	82	343·57	1402·18
20	83	270·70	1058·61
21	84	210·34	787·905
22	85	161·05	577·565
23	86	121·31	416·515
24	87	89·801	295·205
25	88	65·060	205·404
26	89	46·324	140·344
27	90	32·289	94·0204
28	91	22·026	61·7314
29	92	14·694	39·7054
30	93	9·5731	25·0114
31	94	6·0965	15·4383
32	95	3·7932	9·34181
33	96	2·3070	5·54861
34	97	1·3734	3·24161
35	98	·80145	1·86821
36	99	·46613	1·06676
37	100	·26924	·60063
38	101	·14926	·33139
39	102	·08536	·18213
40	103	·04851	·09677
41	104	·02799	·04826
42	105	·01550	·02027
43	106	·00477	·00477

63 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 34 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	44	11701	124877	61	95	·88545	2·11350
11	45	10701	113176	62	96	·52768	1·22805
12	46	9791·4	102475	63	97	·30722	·70037
13	47	8960·7	92683·5	64	98	·17494	·39315
14	48	8199·9	83722·8	65	99	·09905	·21821
15	49	7500·8	75522·9	66	100	·05554	·11916
16	50	6856·4	68022·1	67	101	·02981	·06362
17	51	6260·7	61165·7	68	102	·01645	·03381
18	52	5709·9	54905·0	69	103	·00899	·01736
19	53	5200 9	49195·1	70	104	·00497	·00837
20	54	4730·9	43994·2	71	105	·00263	·00340
21	55	4297·4	39263·3	72	106	·00077	·00077
22	56	3898·1	34965·9				
23	57	3530·6	31067·8				
24	58	3192·4	27537·2				
25	59	2881·7	24344·8				
26	60	2596·4	21463·1				
27	61	2334·8	18866·7				
28	62	2095·0	16531·9				
29	63	1875·5	14436·9				
30	64	1674·8	12561·4				
31	65	1491·6	10886·6				
32	66	1325·4	9394·98				
33	67	1172·3	8069·58				
34	68	1034·0	6897·28				
35	69	908·68	5863·28				
36	70	795·17	4954·60				
37	71	692·73	4159·43				
38	72	600·42	3466·70				
39	73	517·55	2866·28				
40	74	443·34	2348·73				
41	75	377·27	1905·39				
42	76	318·59	1628·12				
43	77	266·85	1309·53				
44	78	221·39	1042·68				
45	79	181·80	821·286				
46	80	147·58	639·486				
47	81	118·40	491·906				
48	82	93·762	373·506				
49	83	73·271	279·744				
50	84	56·453	206·473				
51	85	42·846	150·020				
52	86	31·974	107·174				
53	87	23·439	75·2002				
54	88	16·805	51·7612				
55	89	11·833	34·9562				
56	90	8·1490	23·1232				
57	91	5·4869	14·9742				
58	92	3·6090	9·48730				
59	93	2·3152	5·87830				
60	94	1·4496	3·56310				

DIFFERENCE OF AGE, 62 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*		
10	72	1976·6	12041·9
11	73	1710·1	10065·3
12	74	1472·0	8355·24
13	75	1260·0	6883·24
14	76	1071·1	5623·24
15	77	903·57	4552·14
16	78	755·26	3648·57
17	79	624·85	2893·31
18	80	511·07	2268·46
19	81	413·11	1757·39
20	82	329·66	1344·28
21	83	259·64	1014·62
22	84	201·69	754·985
23	85	154·38	553·295
24	86	116·25	398·915
25	87	86·026	282·665
26	88	62·307	196·639
27	89	44·354	134·332
28	90	30·909	89·9779
29	91	21·080	59·0689
30	92	14·062	37·9889
31	93	9·1600	23·9269
32	94	5·8326	14·7669
33	95	3·6286	8·93431
34	96	2·2065	5·30571
35	97	1·3134	3·09921
36	98	·76631	1·78581
37	99	·44561	1·01950
38	100	·25733	·57389
39	101	·14263	·31656
40	102	·08154	·17393
41	103	·04633	·09239
42	104	·02672	·04606
43	105	·01479	·01934
44	106	·00455	·00455

62 YEARS.

DIFFERENCE OF AGE, 35 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	45	11158	118077	61	96	·56295	1·31414
11	46	10200	106919	62	97	·32844	·75119
12	47	9328·1	96718·9	63	98	·18747	·42275
13	48	8532·2	87390·8	64	99	·10641	·23528
14	49	7803·4	78858·6	65	100	·05985	·12887
15	50	7133·8	71055·2	66	101	·03222	·06902
16	51	6516·7	63921·4	67	102	·01784	·03680
17	52	5945·9	57404·7	68	103	·00979	·01896
18	53	5418·2	51458·8	69	104	·00543	·00917
19	54	4930·6	46040·6	70	105	·00289	·00374
20	55	4480·4	41110·0	71	106	·00085	·00085
21	56	4065·3	36629·6				
22	57	3683·2	32564·3				
23	58	3331·5	28881·1				
24	59	3008·2	25549·6				
25	60	2711·1	22541·4				
26	61	2438·5	19830·3				
27	62	2188·5	17391·8				
28	63	1959·6	15203·3				
29	64	1750·2	13243·7				
30	65	1558·9	11493·5				
31	66	1384·4	9934·58				
32	67	1225·5	8550·18				
33	68	1081·1	7324·68				
34	69	950·19	6243·56				
35	70	831·64	5293·37				
36	71	724·64	4461·73				
37	72	628·19	3737·09				
38	73	541·63	3108·90				
39	74	464·09	2567·27				
40	75	395·04	2103·18				
41	76	333·71	1708·14				
42	77	279·60	1374·43				
43	78	232·07	1094·83				
44	79	190·65	862·759				
45	80	154·84	672·109				
46	81	124·28	517·269				
47	82	98·471	392·989				
48	83	76·993	294·518				
49	84	59·357	217·525				
50	85	45·080	158·168				
51	86	33·667	113·088				
52	87	24·700	79·4206				
53	88	17·726	54·7206				
54	89	12·494	36·9946				
55	90	8·6142	24·5006				
56	91	5·8070	15·8864				
57	92	3·8247	10·0794				
58	93	2·4569	6·25471				
59	94	1·5409	3·79781				
60	95	·94277	2·25691				

DIFFERENCE OF AGE, 61 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*		
10	71	2179·6	13748·5
11	72	1895·7	11568·9
12	73	1641·6	9673·17
13	74	1414·0	8031·57
14	75	1210·9	6617·57
15	76	1029·6	5406·67
16	77	868·44	4377·07
17	78	725·60	3508·63
18	79	600·05	2783·03
19	80	490·56	2182·98
20	81	396·38	1692·42
21	82	316·19	1296·04
22	83	248·96	979·845
23	84	193·33	730·885
24	85	147·94	537·555
25	86	111·36	389·615
26	87	82·385	278·255
27	88	59·656	195·870
28	89	42·458	136·214
29	90	37·242	93·7562
30	91	20·173	56·5142
31	92	13·455	36·3412
32	93	8·7635	22·8862
33	94	5·5795	14·1227
34	95	3·4706	8·54317
35	96	2·1101	5·07257
36	97	1·2558	2·96247
37	98	·73257	1·70667
38	99	·42590	·97410
39	100	·24590	·54820
40	101	·13625	·30230
41	102	·07787	·16605
42	103	·04423	·08818
43	104	·02550	·04395
44	105	·01411	·01845
45	106	·00434	·00434

61 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 36 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	y.			x.	y.		
10	46	10635	111403	61	97	·35039	·80373
11	47	9717·2	100768	62	98	·20042	·45334
12	48	8882·0	91050·7	63	99	·11403	·25292
13	49	8119·7	82168·7	64	100	·06430	·13889
14	50	7421·6	74049·0	65	101	·03471	·07459
15	51	6780·3	66627·4	66	102	·01928	·03988
16	52	6188·9	59847·1	67	103	·01061	·02060
17	53	5642·2	53658·2	68	104	·00591	·00999
18	54	5136·7	48016·0	69	105	·00315	·00408
19	55	4669·5	42879·3	70	106	·00093	·00093
20	56	4238·4	38209·8				
21	57	3841·3	33971·4				
22	58	3475·5	30130·1				
23	59	3139·2	26654·6				
24	60	2830·1	23515·4				
25	61	2546·3	20685·3				
26	62	2285·8	18139·0				
27	63	2047·1	15853·2				
28	64	1828·6	13806·1				
29	65	1629·0	11977·5				
30	66	1446·8	10348·5				
31	67	1281·0	8901·73				
32	68	1130·2	7620·73				
33	69	948 73	6490·53				
34	70	869·63	5541·80				
35	71	757·87	4672·17				
36	72	657·13	3914·30				
37	73	566·68	3257·17				
38	74	485·67	2690·49				
39	75	413·53	2204·82				
40	76	349·43	1791·29				
41	77	292·87	1441·86				
42	78	243·16	1148·99				
43	79	199·85	905·828				
44	80	162·38	705·978				
45	81	130·39	543·598				
46	82	103·36	413·208				
47	83	80·860	309·848				
48	84	62·373	228·988				
49	85	47·399	166·615				
50	86	35·422	119·216				
51	87	26·008	83·7943				
52	88	18·681	57·7863				
53	89	13·179	39·1053				
54	90	9·0958	25·9263				
55	91	6·1385	16·8305				
56	92	4·0478	10·6920				
57	93	2·6038	6·64423				
58	94	1·6352	4·04043				
59	95	1·0021	2·40523				
60	96	·59940	1·40313				

DIFFERENCE OF AGE, 60 YEARS

10	70	2391·8	15584·1
11	71	2090·5	13192·3
12	72	1819·8	11101·8
13	73	1577·0	9281·98
14	74	1359·0	7704·98
15	75	1164·0	6345·98
16	76	989·54	5181·98
17	77	834·34	4192·44
18	78	696·80	3358·10
19	79	575·98	2661·30
20	80	470 69	2085·32
21	81	380·19	1614·63
22	82	303·18	1234·44
23	83	238·64	931·263
24	84	185·26	692·623
25	85	141·72	507·363
26	86	106·65	365·643
27	87	78·880	258·993
28	88	57·106	180·113
29	89	40·636	123·007
30	90	28·309	82·3715
31	91	19·302	54·0625
32	92	12·873	34·7605
33	93	8·3832	21·8875
34	94	5·3365	13·5043
35	95	3·3190	8·16775
36	96	2·0176	4·84875
37	97	1·2005	2·83115
38	98	·70017	1·63065
39	99	·40697	·93048
40	100	·23490	·52351
41	101	·13013	·28861
42	102	·07435	·15848
43	103	·04221	·08413
44	104	·02433	·04192
45	105	·01346	·01759
46	106	·00413	·00413

60 YEARS.

DIFFERENCE OF AGE, 37 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	y.			x.	y.		
10	47	10132	105080	61	98	·21381	·48501
11	48	9252·6	94948·4	62	99	·12191	·27120
12	49	8452·6	85695·8	63	100	·06890	·14929
13	50	7722·4	77243·2	64	101	·03729	·08039
14	51	7053·8	69520·8	65	102	·02077	·04310
15	52	6439·3	62467·0	66	103	·01147	·02233
16	53	5872·8	56027·7	67	104	·00641	·01086
17	54	5349·0	50154·9	68	105	·00343	·00445
18	55	4864·7	44805·9	69	106	·00102	·00102
19	56	4417·4	39941·2				
20	57	4004·8	35523·8				
21	58	3624·6	31519·0				
22	59	3274·9	27894·4				
23	60	2953·4	24619·5				
24	61	2658·0	21666·1				
25	62	2386·8	19008·1				
26	63	2138·1	16621·3				
27	64	1910·3	14483·2				
28	65	1702·1	12572·9				
29	66	1511·9	10870·8				
30	67	1338·8	9358·94				
31	68	1181·3	8020·14				
32	69	1038·5	6838·84				
33	70	909·22	5800·34				
34	71	792·49	4891·12				
35	72	687·26	4098·63				
36	73	592·78	3411·37				
37	74	508·14	2818·59				
38	75	432·76	2310·45				
39	76	365·78	1877·69				
40	77	306·66	1511·91				
41	78	254·70	1205·25				
42	79	209·40	950·548				
43	80	170·21	741·148				
44	81	136·74	570·938				
45	82	108·44	434·198				
46	83	84·876	325·758				
47	84	65·505	240·882				
48	85	49·807	175·377				
49	86	37·245	125·570				
50	87	27·364	88·3254				
51	88	19·670	60·9614				
52	89	13·889	41·2914				
53	90	9·5944	27·4024				
54	91	6·4817	17·8080				
55	92	4·2789	11·3263				
56	93	2·7557	7·04741				
57	94	1·7330	4·29171				
58	95	1·0635	2·55871				
59	96	·63712	1·49521				
60	97	·37308	·85809				

DIFFERENCE OF AGE, 59 YEARS.

10	69	2613·4	17574·6
11	70	2294·0	14961·2
12	71	2006·7	12667·2
13	72	1748·1	10660·5
14	73	1515·5	8912·37
15	74	1306·3	7396·87
16	75	1118·7	6090·57
17	76	950·68	4971·87
18	77	801·22	4021·19
19	78	668·85	3219·97
20	79	552·65	2551·12
21	80	451·47	1998·47
22	81	364·54	1547·00
23	82	290·62	1182·46
24	83	228·69	891·839
25	84	177·47	663·149
26	85	135·72	485·679
27	86	102·11	349·959
28	87	75·509	247·849
29	88	54·656	172·340
30	89	38·887	117·684
31	90	27·087	78·7968
32	91	18·467	51·7098
33	92	12·314	33·2428
34	93	8·0181	20·9288
35	94	5·1034	12·9107
36	95	3·1735	7·80729
37	96	1·9288	4·63379
38	97	1·1474	2·70499
39	98	·66905	1·55759
40	99	·38878	·88854
41	100	·22434	·49976
42	101	·12423	·27542
43	102	·07095	·15119
44	103	·04027	·08024
45	104	·02320	·03997
46	105	·01283	·01677
47	106	·00394	·00394

59 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 38 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	48	9647·2	98964·7	61	99	·13006	·29013
11	49	8805·2	89317·5	62	100	·07366	·16007
12	50	8039·0	80512·3	63	101	·03997	·08641
13	51	7339·7	72473·3	64	102	·02232	·04644
14	52	6699·1	65133·6	65	103	·01236	·02412
15	53	6110·4	58434·5	66	104	·00693	·01176
16	54	5567·6	52324·1	67	105	·00372	·00483
17	55	5065·8	46756·5	68	106	·00111	·00111
18	56	4602·0	41690·7				
19	57	4173·9	37088·7				
20	58	3778·9	32914·8				
21	59	3415·4	29135·9				
22	60	3081·0	25720·5				
23	61	2773·8	22639·5				
24	62	2491·5	19865·7				
25	63	2232·6	17374·2				
26	64	1995·2	15141·6				
27	65	1778·1	13146·4				
28	66	1579·7	11368·3				
29	67	1399·0	9788·64				
30	68	1234·6	8389·64				
31	69	1085·5	7155·04				
32	70	950 47	6069·54				
33	71	828·57	5119·07				
34	72	718·66	4290·50				
35	73	619·97	3571·84				
36	74	531·55	2951·87				
37	75	452·78	2420·32				
38	76	382·80	1967·54				
39	77	321·02	1584·74				
40	78	266·70	1263·72				
41	79	219·34	997·025				
42	80	178·35	777·685				
43	81	143·34	599·335				
44	82	113·72	455·995				
45	83	89·049	342·275				
46	84	68·759	253·226				
47	85	52·308	184·467				
48	86	39·137	132·159				
49	87	28·772	93·0216				
50	88	20·695	64·2496				
51	89	14·624	43·5546				
52	90	10·111	28·9306				
53	91	6·8369	18·8196				
54	92	4·5181	11·9827				
55	93	2·9130	7·46457				
56	94	1·8341	4·55157				
57	95	1·1270	2·71747				
58	96	·67614	1·59047				
59	97	·39655	·91433				
60	98	·22765	·51778				

DIFFERENCE OF AGE, 58 YEARS.

10	68	2844 0	19715·9				
11	69	2506·4	16871·9				
12	70	2202·1	14365·5				
13	71	1927·7	12163·4				
14	72	1680·0	10235·7				
15	73	1456·8	8555·65				
16	74	1255·5	7098·85				
17	75	1074·8	5843·35				
18	76	912·94	4768·55				
19	77	769·08	3855·61				
20	78	641·76	3086·53				
21	79	530·07	2444·77				
22	80	432·89	1914·70				
23	81	349·44	1481·81				
24	82	278·49	1132·37				
25	83	219·07	853·881				
26	84	169·96	634·811				
27	85	129·95	464·851				
28	86	97·744	334·901				
29	87	72·268	237·157				
30	88	52·303	164·889				
31	89	37·209	112·586				
32	90	25·915	75·3773				
33	91	17·666	49·4623				
34	92	11·788	31·7963				
35	93	7·6678	20·0083				
36	94	4·8796	12·3405				
37	95	3·0337	7·46093				
38	96	1·8435	4·42723				
39	97	1·0964	2·58373				
40	98	·63914	1·48373				
41	99	·37129	·84819				
42	100	·21417	·47690				
43	101	·11856	·26273				
44	102	·06769	·14417				
45	103	·03840	·07648				
46	104	·02211	·03808				
47	105	·01222	·01597				
48	106	·00375	·00375				

58 YEARS.

DIFFERENCE OF AGE, 39 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	49	9180·8	93093·1	61	100	·07858	·17120
11	50	8374·4	83912·3	62	101	·04273	·09262
12	51	7640·6	75537·9	63	102	·02392	·04989
13	52	6970·6	67897·3	64	103	·01328	·02597
14	53	6356·9	60926·7	65	104	·00747	·01269
15	54	5792·9	54569·8	66	105	·00402	·00522
16	55	5272·9	48776·9	67	106	·00120	·00120
17	56	4792·2	43504·0				
18	57	4348·3	38711·8				
19	58	3938·5	34363·5				
20	59	3560·9	30425·0				
21	60	3213·2	26864·1				
22	61	2893·7	23650·9				
23	62	2600·0	20757·2				
24	63	2330·5	18157·2				
25	64	2083·3	15826·7				
26	65	1857·1	13743·4				
27	66	1650·2	11886·3				
28	67	1461·7	10236·1				
29	68	1290·1	8774·41				
30	69	1134·5	7484·31				
31	70	993·47	6349·81				
32	71	866·16	5356·34				
33	72	751·38	4490·18				
34	73	648·29	3738·80				
35	74	555 92	3090·51				
36	75	473·64	2534·59				
37	76	400·51	2060·95				
38	77	335·95	1660·44				
39	78	279·18	1324·49				
40	79	229·67	1045·31				
41	80	186·81	815·636				
42	81	150·19	628·826				
43	82	119·21	478·636				
44	83	93·385	359·426				
45	84	72·139	266·041				
46	85	54·906	193·902				
47	86	41·102	138·996				
48	87	30·234	97 8944				
49	88	21·760	67·6604				
50	89	15·387	45·9004				
51	90	10·646	30·5134				
52	91	7·2050	19·8674				
53	92	4·7658	12·6624				
54	93	3·0759	7·89655				
55	94	1·9388	4·82065				
56	95	1·1928	2·88185				
57	96	·71655	1·68905				
58	97	·42084	·97250				
59	98	·24198	·55166				
60	99	·13848	·30968				

DIFFERENCE OF AGE, 57 YEARS.

10	67	3084·0	22010·9				
11	68	2727·6	18926·9				
12	69	2406·0	16199·3				
13	70	2115·4	13793·3				
14	71	1852·6	11677·9				
15	72	1614·9	9825·30				
16	73	1400·1	8210·40				
17	74	1206·2	6810·30				
18	75	1032·1	5604·10				
19	76	876·32	4572·00				
20	77	737·93	3695·68				
21	78	615·54	2957·75				
22	79	508·26	2342·21				
23	80	414·96	1833·95				
24	81	334·86	1418·99				
25	82	266·79	1084·13				
26	83	209·80	817·345				
27	84	162·73	607·545				
28	85	124·39	444·815				
29	86	93·549	320·425				
30	87	69·158	226·876				
31	88	50·046	157·718				
32	89	35·598	107·672				
33	90	24·790	72·0738				
34	91	16·896	47·2838				
35	92	11·263	30·3878				
36	93	7·3316	19·1248				
37	94	4·6648	11·7932				
38	95	2·8996	7·12840				
39	96	1·7616	4·22880				
40	97	1·0474	2·46720				
41	98	·61039	1·41980				
42	99	·35447	·80941				
43	100	·20440	·45494				
44	101	·11311	·25054				
45	102	·06455	·13743				
46	103	·03660	·07288				
47	104	·02107	·03628				
48	105	·01164	·01521				
49	106	·00357	·00357				

57 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 40 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	50	8731·6	87456·9	61	101	·04558	·09903
11	51	7959·4	78725·3	62	102	·02557	·05345
12	52	7256·4	70765·9	63	103	·01423	·02788
13	53	6614·5	63509·5	64	104	·00802	·01365
14	54	6026·5	56895·0	65	105	·00433	·00563
15	55	5486·2	50868·5	66	106	·00130	·00130
16	56	4988·1	45382·3				
17	57	4528·1	40394·2				
18	58	4103·1	35866·1				
19	59	3711·2	31763·0				
20	60	3350·1	28051·8				
21	61	3017·8	24701·7				
22	62	2712·4	21683·9				
23	63	2432·0	18971·5				
24	64	2174 8	16539·5				
25	65	1939·1	14364·7				
26	66	1723·5	12425·6				
27	67	1527·0	10702·1				
28	68	1347·9	9175·10				
29	69	1185·5	7827·20				
30	70	1038·3	6641·70				
31	71	905·35	5603·40				
32	72	785·46	4698·05				
33	73	677·80	3912·59				
34	74	581·32	3234·79				
35	75	495·36	2653·47				
36	76	418·95	2158·11				
37	77	351·49	1739·16				
38	78	292·17	1387·67				
39	79	240·42	1095·50				
40	80	195·61	855·081				
41	81	157·32	659·471				
42	82	124·91	502·151				
43	83	97·889	377·241				
44	84	75·652	279·352				
45	85	57·606	203·700				
46	86	43·144	146·094				
47	87	31·752	102·950				
48	88	22 866	71·1975				
49	89	16·178	48·3315				
50	90	11·201	32·1535				
51	91	7·5866	20·9525				
52	92	5 0223	13·3659				
53	93	3·2445	8·34364				
54	94	2·0472	5·09914				
55	95	1·2609	3·05194				
56	96	·75835	1·79104				
57	97	·44600	1·03269				
58	98	·25680	·58669				
59	99	·14719	·32989				
60	100	·08367	·18270				

DIFFERENCE OF AGE, 56 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*		
10	66	3332·9	24463·6
11	67	2958·8	21130·7
12	68	2618·4	18171·9
13	69	2311·3	15553·5
14	70	2033·0	13242·2
15	71	1780·8	11209·2
16	72	1552·1	9428·42
17	73	1345·1	7876·32
18	74	1158·3	6531·22
19	75	990·70	5372·92
20	76	840·83	4382·22
21	77	707·79	3541·39
22	78	590·22	2833·60
23	79	487·21	2243·38
24	80	397·64	1756·17
25	81	320·78	1358·53
26	82	255·50	1037·75
27	83	200·88	782·253
28	84	155·78	581·373
29	85	119·05	425·593
30	86	89·523	306·543
31	87	66·173	217·020
32	88	47·880	150·847
33	89	34·053	102·967
34	90	23·711	68·9139
35	91	16·158	45·2029
36	92	10·769	29·0449
37	93	7·0088	18·2759
38	94	4·4585	11·2671
39	95	2·7707	6·80859
40	96	1·6828	4·03789
41	97	1·0003	2·35509
42	98	·58274	1·35479
43	99	·33829	·77205
44	100	·19500	·43376
45	101	·10785	·23876
46	102	·06152	·13091
47	103	·03487	·06939
48	104	·02006	·03452
49	105	·01107	·01446
50	106	·00339	·00339

56 YEARS.

DIFFERENCE OF AGE, 41 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	51	8298·9	82048·5	61	102	·02728	·05714
11	52	7559·1	73749·6	62	103	·01521	·02986
12	53	6885·7	66190·5	63	104	·00860	·01465
13	54	6270·8	59304·8	64	105	·00465	·00605
14	55	5707·5	53034·0	65	106	·00140	·00140
15	56	5189·9	47326·5				
16	57	4713·2	42136·6				
17	58	4272·7	37423·4				
18	59	3866·3	33150·7				
19	60	3491·5	29284·4				
20	61	3146·4	25792·9				
21	62	2828·8	22646·5				
22	63	2537·2	19817·8				
23	64	2269·5	17280·6				
24	65	2024·2	15011·1				
25	66	1799·7	12986·9				
26	67	1594·8	11187·2				
27	68	1408·1	9592·39				
28	69	1238·6	8184·29				
29	70	1085·0	6945·69				
30	71	946·18	5860·69				
31	72	821·00	4914·51				
32	73	708·55	4093·51				
33	74	607·78	3384·96				
34	75	517·99	2777·18				
35	76	438·17	2259·19				
36	77	36·768	1821·02				
37	78	305·68	1453·34				
38	79	251·60	1147·66				
39	80	204·76	896·065				
40	81	164·72	691·305				
41	82	130·84	626·585				
42	83	102·57	395·745				
43	84	79·301	293·175				
44	85	60·411	213·847				
45	86	45·265	153·463				
46	87	33·329	108·198				
47	88	24·014	74·8687				
48	89	17·000	50·8547				
49	90	11·778	33·8547				
50	91	7·9820	22·0767				
51	92	5·2882	14·0947				
52	93	3·4191	8·80653				
53	94	2·1594	5·38743				
54	95	1·3314	3·22803				
55	96	·80165	1·89663				
56	97	·47201	1·09498				
57	98	·27215	·62297				
58	99	·15621	·35082				
59	100	·08894	·19461				
60	101	·04853	·10567				

DIFFERENCE OF AGE, 55 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*		
10	65	3591·1	27073·5
11	66	3196·6	23482·4
12	67	2839·3	20285·8
13	68	2515·3	17446·5
14	69	2221·3	14931·2
15	70	1954·1	12709·9
16	71	1711·6	10755·8
17	72	1491·1	9044·22
18	73	1291·7	7553·12
19	74	1111·8	6261·42
20	75	950·57	5149·62
21	76	806·48	4199·05
22	77	678·66	3392·57
23	78	565·76	2713·91
24	79	466·87	2148·15
25	80	380·92	1681·28
26	81	307·20	1300·36
27	82	244·63	993·161
28	83	192·29	748·531
29	84	149·09	556·241
30	85	113·93	407·151
31	86	85·660	293·221
32	87	63·309	207·561
33	88	45·802	144·252
34	89	32·570	98·4504
35	90	22·675	65·8804
36	91	15·450	43·2054
37	92	10·295	27·7554
38	93	6·6989	17·4604
39	94	4·2603	10·7615
40	95	2·6468	6·50116
41	96	1·6071	3·85436
42	97	·95498	2·24726
43	98	·55615	1·29228
44	99	·32273	·73613
45	100	·18594	·41340
46	101	·10280	·22746
47	102	·05861	·12466
48	103	·03320	·06605
49	104	·01909	·03285
50	105	·01053	·01376
51	106	·00323	·00323

55 YEARS.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, 42 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	52	7881·5	76860·3	61	103	·01623	·03191
11	53	7173·0	68978·8	62	104	·00919	·01568
12	54	6527·9	61805·8	63	105	·00499	·00649
13	55	5938·8	55277·9	64	106	·00150	·00150
14	56	5399·2	49339·1				
15	57	4903·8	43939·9				
16	58	4447·3	39036·1				
17	59	4026·1	34588·8				
18	60	3637·4	30562·7				
19	61	3279·2	26925·3				
20	62	2949·2	23646·1				
21	63	2646·0	20696·9				
22	64	2367·6	18050·9				
23	65	2112·4	15683·3				
24	66	1878·7	13570·9				
25	67	1665·3	11692·2				
26	68	1470·7	10026·9				
27	69	1293·9	8556·22				
28	70	1133·6	7262·32				
29	71	988·73	6128·72				
30	72	858·03	5139·99				
31	73	740·62	4281·96				
32	74	635·36	3541·34				
33	75	541·57	2905·98				
34	76	458·18	2364·41				
35	77	384·54	1906·23				
36	78	319·76	1521·69				
37	79	263·24	1201·93				
38	80	214·29	938·695				
39	81	172·43	724·405				
40	82	137·00	551·975				
41	83	107·44	414·975				
42	84	83·093	307·535				
43	85	63·325	224·442				
44	86	47·469	161·117				
45	87	34·968	113·648				
46	88	25·207	78·6797				
47	89	17·854	53·4727				
48	90	12·376	35·6187				
49	91	8·3927	23·2427				
50	92	5·5640	14·8500				
51	93	3·6002	9·28602				
52	94	2·2756	5·68582				
53	95	1·4043	3·41022				
54	96	·84646	2·00592				
55	97	·49896	1·15946				
56	98	·28803	·66050				
57	99	·16555	·37247				
58	100	·09438	·20692				
59	101	·05159	·11254				
60	102	·02904	·06095				

DIFFERENCE OF AGE, 54 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*		
10	64	3858·2	29846·3
11	65	3444·2	25988·1
12	66	3068·5	22543·9
13	67	2727·5	19475·4
14	68	2417·3	16747·9
15	69	2135·1	14330·6
16	70	1878·2	12195·5
17	71	1644·3	10317·3
18	72	1432·0	8672·95
19	73	1239·9	7240·95
20	74	1066·8	6001·05
21	75	911·75	4934·25
22	76	773·30	4022·50
23	77	650·55	3249·20
24	78	542·15	2598·65
25	79	447·25	2056·50
26	80	364·80	1609·25
27	81	294·13	1244·45
28	82	234·17	950·325
29	83	184·04	716·155
30	84	142·67	532·115
31	85	109·01	389·445
32	86	81·952	280·435
33	87	60·561	198·483
34	88	43·808	137·922
35	89	31·147	94·1135
36	90	21·681	62·9665
37	91	14·769	41·2855
38	92	9·8399	26·5165
39	93	6·4012	16·6766
40	94	4·0698	10·2754
41	95	2·5278	6·20561
42	96	1·5343	3·67781
43	97	·91140	2·14351
44	98	·53056	1·23211
45	99	·30774	·70155
46	100	·17723	·39381
47	101	·09794	·21658
48	102	·05581	·11864
49	103	·03160	·06283
50	104	·01816	·03123
51	105	·01001	·01307
52	106	·00306	·00306

54 YEARS.

DIFFERENCE OF AGE, 43 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	53	7479·0	71886·5	61	104	·00981	·01675
11	54	6800·2	64407·5	62	105	·00533	·00694
12	55	6182·3	57607·3	63	106	·00161	·00161
13	56	5618·1	51425·0				
14	57	5101·7	45806·9				
15	58	4627·2	40705·2				
16	59	4190·7	36078·0				
17	60	3787·7	31887·3				
18	61	3416·2	28099·6				
19	62	3073·7	24683·4				
20	63	2758·7	21609·7				
21	64	2469·2	18851·0				
22	65	2203·7	16381·8				
23	66	1960·5	14178·1				
24	67	1738·4	12217·6				
25	68	1535·7	10479·2				
26	69	1351·4	8943·53				
27	70	1184·2	7592·13				
28	71	1033·1	6407·93				
29	72	896·62	5374·83				
30	73	774·02	4478·21				
31	74	664·10	3704·19				
32	75	566·14	3040·09				
33	76	479·04	2473·95				
34	77	402·11	1994·91				
35	78	334·43	1592·80				
36	79	275·36	1258·37				
37	80	224·20	983·013				
38	81	180·45	758·813				
39	82	143·41	578·363				
40	83	112·50	434·953				
41	84	87·035	322·453				
42	85	66·353	235·418				
43	86	49·759	169·065				
44	87	36·670	119·306				
45	88	26·446	82·6363				
46	89	18·741	56·1903				
47	90	12·997	37·4493				
48	91	8·8191	24·4523				
49	92	5·8502	15·6332				
50	93	3·7879	9·78295				
51	94	2·3961	5·99505				
52	95	1·4799	3·59895				
53	96	·89286	2·11905				
54	97	·52685	1·22619				
55	98	·30447	·69934				
56	99	·17520	·39487				
57	100	·10002	·21967				
58	101	·05475	·11965				
59	102	·03087	·06490				
60	103	·01728	·03403				

DIFFERENCE OF AGE, 53 YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*		
10	63	4134·5	32783·2
11	64	3700·3	2864·87
12	65	3306·2	24948·4
13	66	2947·7	21642·2
14	67	2621·3	18694·5
15	68	2323·6	16073·2
16	69	2052·1	13749·6
17	70	1804·4	11697·5
18	71	1579·1	9893·13
19	72	1374·5	8314·03
20	73	1189·7	6939·53
21	74	1023·2	5749·83
22	75	874·23	4726·63
23	76	741·26	3852·40
24	77	623·40	3111·14
25	78	519·36	2487·74
26	79	428·32	1968·38
27	80	349·28	1540·06
28	81	281·56	1190·78
29	82	224·12	909·224
30	83	176·12	685·104
31	84	136·52	508·984
32	85	104·30	372·464
33	86	78·395	268·164
34	87	57·925	189·769
35	88	41·894	131·844
36	89	29·782	89·9496
37	90	20·726	60·1676
38	91	14·116	39·4416
39	92	9·4026	25·3256
40	93	6·1150	15·9230
41	94	3·8868	9·80803
42	95	2·4133	5·92123
43	96	1·4643	3·50793
44	97	·86946	2·04363
45	98	·50592	1·17417
46	99	·29332	·66825
47	100	·16884	·37493
48	101	·09325	·20609
49	102	·05311	·11284
50	103	·03005	·05973
51	104	·01726	·02968
52	105	·00951	·01242
53	106	·00291	·00291

53 YEARS.

Table 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

Difference of Age, 44 Years.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	54	7090·3	67120·6	61	105	·00569	·00741
11	55	6440·2	60030·3	62	106	·00172	·00172
12	56	5848·4	53590·1				
13	57	5308·4	47741·7				
14	58	4813·9	42433·3				
15	59	4360·2	37619·4				
16	60	3942·6	33259·2				
17	61	3557·4	29316·6				
18	62	3202·2	25759·2				
19	63	2875·2	22557·0				
20	64	2574·3	19681·8				
21	65	2298·3	17107·5				
22	66	2045·2	14809·2				
23	67	1814·1	12764·0				
24	68	1603·2	10949·9				
25	69	1411·2	9346·69				
26	70	1236·8	7935·49				
27	71	1079·2	6698·69				
28	72	936·82	5619·49				
29	73	808·82	4682·67				
30	74	694·06	3873·85				
31	75	591·75	3179·79				
32	76	500·77	2588·04				
33	77	420·42	2087·27				
34	78	349·71	1666·85				
35	79	287·99	1317·14				
36	80	234·53	1029·15				
37	81	188·80	794·618				
38	82	150·08	605·818				
39	83	117·78	455·738				
40	84	91·134	337·958				
41	85	69·501	246·824				
42	86	52·138	177·323				
43	87	38·439	125·185				
44	88	27·733	86·7457				
45	89	19·662	59·0127				
46	90	13·643	39·3507				
47	91	9·2620	25·7077				
48	92	6·1474	16·4457				
49	93	3·9828	10·2983				
50	94	2·5210	6·31550				
51	95	1·5583	3·79450				
52	96	·94092	2·23620				
53	97	·55573	1·29528				
54	98	·32149	·73955				
55	99	·18520	·41806				
56	100	·10586	·23286				
57	101	·05802	·12700				
58	102	·03276	·06898				
59	103	·01837	·03622				
60	104	·01044	·01785				

Difference of Age, 52 Years.

10	62	4420·1	35887·0
11	63	3965·4	31466·9
12	64	3552·1	27501·5
13	65	3176·1	23949·4
14	66	2832·9	20773·3
15	67	2519·6	17940·4
16	68	2233·2	15420·8
17	69	1971·5	13187·6
18	70	1732·8	11216·1
19	71	1515·7	9483·31
20	72	1318·8	7967·61
21	73	1141·1	6648·81
22	74	981·13	5507·71
23	75	838·01	4526·58
24	76	710·33	3688·57
25	77	597·19	2978·24
26	78	497·38	2381·05
27	79	410·10	1883·67
28	80	334·35	1473·57
29	81	269·48	1139·22
30	82	214·46	869·741
31	83	168·52	655·281
32	84	130·61	486·761
33	85	99·769	356·151
34	86	74·982	256·382
35	87	55·394	181·400
36	88	40·057	126·006
37	89	28·470	85·9493
38	90	19·810	57·4793
39	91	13·489	37·6693
40	92	8·9822	24·1803
41	93	5·8399	15·1981
42	94	3·7107	9·35820
43	95	2·3031	5·64750
44	96	1·3969	3·34440
45	97	·82910	1·94750
46	98	·48221	1·11840
47	99	·27944	·63619
48	100	·16077	·35675
49	101	·08874	·19598
50	102	·05051	·10724
51	103	·02856	·05673
52	104	·01639	·02817
53	105	·00902	·01178
54	106	·00276	·00276

52 Years.

Difference of Age, 45 Years.

Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*			*x.*	*y.*		
10	55	6714·9	62556·8	61	106	·00183	·00183
11	56	6092·4	55841·9				
12	57	5526·1	49749·5				
13	58	5009·0	44223·4				
14	59	4536·1	39214·4				
15	60	4102·0	34678·3				
16	61	3702·8	30576·3				
17	62	3334·6	26873·5				
18	63	2995·3	23538·9				
19	64	2683·0	20543·6				
20	65	2396·1	17860·6				
21	66	2133·0	15464·5				
22	67	1892·5	13331·5				
23	68	1672 9	11439·0				
24	69	1473·1	9766·07				
25	70	1291·5	8292·97				
26	71	1127·2	7001·47				
27	72	978·65	5874·27				
28	73	845·09	4895·62				
29	74	725·27	4050·53				
30	75	618·44	3325·26				
31	76	523·43	2706·82				
32	77	439·49	2183·39				
33	78	365·63	1743·90				
34	79	301·15	1378·27				
35	80	245·28	1077·12				
36	81	197·50	831·839				
37	82	157·02	634·339				
38	83	123·24	477·319				
39	84	95·400	354·079				
40	85	72·774	258·679				
41	86	54·612	185·905				
42	87	40·277	131·293				
43	88	29 071	91·0163				
44	89	20·620	61·9453				
45	90	14·314	41·3253				
46	91	9·7220	27·0113				
47	92	6·4562	17·2893				
48	93	4·1851	10·8331				
49	94	2·6507	6·64797				
50	95	1·6396	3·99727				
51	96	·99085	2·35767				
52	97	·58565	1·36682				
53	98	·33911	·78117				
54	99	·19556	·44206				
55	100	·11190	·24650				
56	101	·06140	·13460				
57	102	·03472	·07320				
58	103	·01949	·03848				
59	104	·01110	·01899				
60	105	·00606	·00789				

Difference of Age, 51 Years.

10	61	4715·5	39161·7
11	62	4239·3	34446·2
12	63	3806·5	30206·9
13	64	3412·3	26400·4
14	65	3052·4	22988·1
15	66	2723·0	19935·7
16	67	2421·7	17212·7
17	68	2145·5	14791·0
18	69	1893·3	12645·5
19	70	1663·3	10752·2
20	71	1455·3	9088·94
21	72	1265·0	7633·64
22	73	1094·2	6368·64
23	74	940·48	5274·44
24	75	803·04	4333·96
25	76	680·46	3530·92
26	77	571·92	2850·46
27	78	476·22	2278·54
28	79	392·57	1802·32
29	80	320·00	1409·75
30	81	257·88	1089·75
31	82	205·22	831·874
32	83	161·22	626·654
33	84	124·94	465·434
34	85	95·425	340·494
35	86	71·706	245·069
36	87	52·965	173·363
37	88	38·293	120·398
38	89	27·211	82·1053
39	90	18·929	54·8943
40	91	12·886	35·9653
41	92	8·5782	23·0793
42	93	5·5754	14·5011
43	94	3·5414	8·92566
44	95	2·1972	5·38426
45	96	1·3321	3·18706
46	97	·79024	1·85496
47	98	·45940	1·06472
48	99	·26608	·60532
49	100	·15300	·33924
50	101	·08440	·18624
51	102	·04801	·10184
52	103	·02712	·05383
53	104	·01555	02671
54	105	·00855	·01116
55	106	·00261	·00261

51 Years.

TABLE 14—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, **46** YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*		
10	56	6352·3	58190·4
11	57	5756·6	51838·1
12	58	5214·4	46081·5
13	59	4719·9	40867·1
14	60	4267·5	36147·2
15	61	3852·6	31879·7
16	62	3470·9	28027·1
17	63	3119·1	24556·2
18	64	2795·1	21437·1
19	65	2497·3	18642·0
20	66	2223·8	16144·7
21	67	1973·7	13920·9
22	68	1745·2	11947·2
23	69	1537·2	10202·0
24	70	1348·2	8664·84
25	71	1177·0	7316·64
26	72	1022·1	6139·64
27	73	882·83	5117·54
28	74	757·79	4234·71
29	75	646·25	3476·92
30	76	547·04	2830·67
31	77	459·37	2283·63
32	78	382·21	1824·26
33	79	314·96	1442·05
34	80	256·49	1127·09
35	81	206·56	870·601
36	82	164·26	664·041
37	83	128·94	499·781
38	84	99·837	370·841
39	85	76·180	271·004
40	86	57·184	194·824
41	87	42·189	137·640
42	88	30·461	95·4508
43	89	21·614	64·9898
44	90	15·011	43·3758
45	91	10·200	28·3648
46	92	6·7768	18·1648
47	93	4·3953	11·3880
48	94	2·7854	6·99266
49	95	1·7239	4·20726
50	96	1·0424	2·48336
51	97	·61666	1·44096
52	98	·35737	·82430
53	99	·20628	·46693
54	100	·11816	·26065
55	101	·06491	·14249
56	102	·03675	·07758
57	103	·02066	·04083
58	104	·01178	·02017
59	105	·00644	·00839
60	106	·00195	·00195

DIFFERENCE OF AGE, **50** YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*		
10	60	5020·8	42606·7
11	61	4522·6	37585·9
12	62	4069·5	33063·3
13	63	3656·7	28993·8
14	64	3279·3	25337·1
15	65	2934·0	22057·8
16	66	2617·1	19123·8
17	67	2326·6	16506·7
18	68	2060·4	14180·1
19	69	1817·3	12119·7
20	70	1595·9	10302·4
21	71	1394·9	8706·47
22	72	1212·9	7311·57
23	73	1048·8	6098·67
24	74	901·23	5049·87
25	75	769·28	4148·64
26	76	651·67	3379·36
27	77	547·59	2727·69
28	78	455·87	2180·10
29	79	375·72	1724·23
30	80	306·23	1348·51
31	81	246·75	1042·28
32	82	196·34	795·531
33	83	154·23	599·191
34	84	119·50	444·961
35	85	91·256	325·461
36	86	68·562	234·205
37	87	50·633	165·643
38	88	36·600	115·010
39	89	26·002	78·4105
40	90	18·083	52·4085
41	91	12·306	34·3255
42	92	8·1896	22·0199
43	93	5·3209	13·8299
44	94	3·3784	8·50897
45	95	2·0951	5·13057
46	96	1·2696	3·03547
47	97	·75285	1·76587
48	98	·43743	1·01302
49	99	·25322	·57559
50	100	.14551	·32237
51	101	·08022	·17686
52	102	·04559	·09664
53	103	·02574	·05105
54	104	·01474	·02531
55	105	·00810	·01057
56	106	·00247	·00247

50 YEARS.

DIFFERENCE OF AGE, **47** YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*		
10	57	6002·2	54016·7
11	58	5431·9	48014·5
12	59	4913·5	42582·6
13	60	4440·5	37669·1
14	61	4008·1	33228·6
15	62	3611·3	29220·5
16	63	3246·6	25609·2
17	64	2910·6	22362·6
18	65	2601·6	19452·0
19	66	2317·7	16850·4
20	67	2057·7	14532·7
21	68	1820·1	12475·0
22	69	1603·7	10654·9
23	70	1406·9	9051·20
24	71	1228·6	7644·30
25	72	1067·3	6415·70
26	73	922·06	5348·40
27	74	791·63	4426·34
28	75	675·23	3634·71
29	76	571·64	2959·48
30	77	480·09	2387·84
31	78	399·51	1907·75
32	79	329·14	1508·24
33	80	268·17	1179·10
34	81	215·99	910·931
35	82	171·79	694·941
36	83	134·88	523·151
37	84	101·45	388·271
38	85	79·724	283·821
39	86	59·860	204·097
40	87	44·175	144·237
41	88	31·907	100·062
42	89	22·648	68·1552
43	90	15·735	45·5072
44	91	10·697	29·7722
45	92	7·1101	19·0752
46	93	4·6136	11·9651
47	94	2·9253	7·35154
48	95	1·8125	4·42624
49	96	1·0960	2·61374
50	97	6·4881	1·51774
51	98	·37629	·86893
52	99	·21738	·49264
53	100	·12463	·27526
54	101	·06854	·15063
55	102	·03885	·08209
56	103	·02186	·04324
57	104	·01248	·02138
58	105	·00683	·00890
59	106	·00207	·00207

DIFFERENCE OF AGE, **49** YEARS.

Ages.		$D_{x,y}$	$N_{x,y}$
x.	*y.*		
10	59	5336·8	46228·9
11	60	4815·4	40892·1
12	61	4341·4	36076·7
13	62	3909·2	31735·3
14	63	3514·2	27826·1
15	64	3152·2	24311·9
16	65	2819·9	21159·7
17	66	2514·4	18339·8
18	67	2234·2	15825·4
19	68	1977·7	13591·2
20	69	1743·7	11613·5
21	70	1530·7	9869·84
22	71	1337 5	8339·14
23	72	1162·7	7001·64
24	73	1005·1	5838·94
25	74	863·34	4833·84
26	75	736·73	3970·50
27	76	623·94	3233·77
28	77	524·18	2609·83
29	78	436·38	2085·65
30	79	359·55	1649·27
31	80	293·02	1289·72
32	81	236·07	996·701
33	82	187·82	760·631
34	83	147·51	572·811
35	84	114·28	425·301
36	85	87·254	311·021
37	86	65·543	223·767
38	87	48·394	158 224
39	88	34·973	109·830
40	89	24·839	74·8572
41	90	17·269	50·0182
42	91	11·749	32·7492
43	92	7·8158	21·0002
44	93	5·0761	13·1844
45	94	3·2216	8·10826
46	95	1·9970	4·88666
47	96	1·2096	2·88966
48	97	·71685	1·68006
49	98	·41628	·96321
50	99	·24083	·54693
51	100	·13830	·30610
52	101	·07619	·16780
53	102	·04326	·09161
54	103	·02440	·04835
55	104	·01396	·02395
56	105	·00766	·00999
57	106	·00233	·00233

49 YEARS.

TABLE **14**—(*continued*).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

DIFFERENCE OF AGE, **48** YEARS.								DIFFERENCE OF AGE, **48** YEARS.							
Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$	Ages.		$D_{x,y}$	$N_{x,y}$
x.	y.			x.	y.			x.	y.			x.	y.		
10	58	5663·6	50030·9	23	71	1282·1	7984·98	35	83	141·07	547·491	47	95	1·9025	4·65160
11	59	5118·4	44367·3	24	72	1114·1	6702·88	36	84	109·27	406·421	48	96	1·1517	2·74910
12	60	4622·6	39248·9	25	73	962·80	5588·78	37	85	83·413	297·151	49	97	·68219	1·59740
13	61	4170·5	34626·3	26	74	826·81	4625·98	38	86	62·645	213·738	50	98	·39591	·91521
14	62	3757·0	30455·8	27	75	705·38	3799·17	39	87	46·243	151·093	51	99	·22889	·51930
15	63	3378·0	26698·8	28	76	597·27	3093·79	40	88	33·409	104·850	52	100	·13134	·29041
16	64	3029·6	23320·8	29	77	501·68	2496·52	41	89	23·722	71·4408	53	101	·07229	·15907
17	65	2709·2	20291·2	30	78	417·52	1994·84	42	90	16·487	47·7188	54	102	·04102	·08678
18	66	2414 6	17582·0	31	79	344·03	1577·32	43	91	11·213	31·2318	55	103	·02311	·04576
19	67	2144·6	15167·4	32	80	280·33	1233·29	44	92	7·4562	20·0188	56	104	·01321	·02265
20	68	1897·6	13022·8	33	81	225·83	952·961	45	93	4·8404	12·5626	57	105	·00724	·00944
21	69	1672 5	11125·2	34	82	179·64	727·131	46	94	3·0706	7·72220	58	106	·00220	·00220
22	70	1467·7	9452·68												

It has already been said, that in the continuous method of constructing auxiliary Tables there is a necessity for the logarithms being carried to more decimal places than by the direct process; but generally seven places will ensure accuracy, provided care be taken in the determination of $\lambda.v$, and this may be done with complete accuracy to as many places as are required by the following formula:—

According to the logarithmic theorem

$$\text{Log. } (1+k) = m_1 k + m_2 k^2 + m_3 k^3 + m_4 k^4 + m_5 k^5 + \&c. \qquad = (A).$$

If in the first member of this equation $k = 0$ then $\lambda.(1+k) = \lambda.1$ and the expansion will not contain any term independent of k.

If k be converted into $k+z$, then

$$\lambda.(1+k+z) = m_1(k+z) + m_2(k+z)^2 + m_3(k+z)^3 + \&c. = (B).$$

But $1+k+z = (1+k)\cdot\left(1+\frac{1}{1+k}z\right)$, therefore

$$\lambda.(1+k+z) = \lambda.(1+k) + \lambda\cdot\left(1+\frac{1}{1+k}z\right)$$

Hence by equation (A)

$$\lambda.(1+k+z) = m_1 k + m_2 k^2 + \&c. + m_1\frac{1}{1+k}z + m_2\left(\frac{1}{1+k}\right)^2 z^2 + \&c. = (C).$$

The second member of this equation must be equal to the second member of equation (B), and by applying the binomial theorem the complete co-efficient of z in (B) is evidently

$$m_1 + 2\,m_2 k + 3\,m_3 k^2 + 4\,m_4 k^3 + \&c.$$

This must correspond with the complete co-efficient of z in equation (C) which is

$$m_1 \frac{1}{1+k} = m_1 - m_1 k + m_1 k^2 - m_1 k^3 + \&c.$$

In equation (C) the terms beyond this contain only the higher powers of z, and these two expressions being the same it therefore follows that

$$\begin{aligned}
m_1 &= m_1 \\
2\,m_2 &= -m_1 \text{ and therefore } m_2 = -\tfrac{1}{2} m_1 \\
3\,m_3 &= +m_1 \quad \ldots \quad m_3 = +\tfrac{1}{3} m_1 \\
4\,m_4 &= -m_1 \quad \ldots \quad m_4 = -\tfrac{1}{4} m_1 \\
5\,m_5 &= +m_1 \quad \ldots \quad m_5 = +\tfrac{1}{5} m_1 \\
6\,m_6 &= -m_1 \quad \ldots \quad m_6 = -\tfrac{1}{6} m_1 \\
\&c. &+ \&c. \quad \ldots \quad \&c. + \&c. \text{ consequently}
\end{aligned}$$

$$\lambda.(1+k) = m_1 \left(k - \frac{k^2}{2} + \frac{k^3}{3} - \frac{k^4}{4} + \frac{k^5}{5} - \frac{k^6}{6} + \&c. \right)$$

and which produces the logarithm of $1+k$; but the symbol m_1 employed above being the modulus of the system of logarithms, the results of the last equation will give either common or Naperian logarithms according as

$m_1 = 1$ = modulus of the Naperian system, or

$$m_1 = \frac{\text{Com. } \lambda.10}{\text{Nap. } \lambda.10} = \frac{1}{2{\cdot}3025851} = {\cdot}434294481903 = \text{modulus of ordinary logarithms.}$$

Hence in the Naperian system

$$\text{Log.}_{\epsilon}\,(1+k) = k - \frac{k^2}{2} + \frac{k^3}{3} - \frac{k^4}{4} + \frac{k^5}{5} - \frac{k^6}{6} + \frac{k^7}{7} - \frac{k^8}{8} + \cdots\cdots$$

This series is always true when k is not greater than 1; it converges slowly when $k = 1$, and more rapidly as k becomes smaller. In the determination of $\lambda.v$ it will almost always happen that k is a small fraction, and then the series above given is rapidly convergent.

Ten per cent., for example, is the highest rate of interest entering into the construction of the preceding Tables, and in that case

$$v = \frac{1}{1+r} = \frac{1}{1{\cdot}1}$$

Hence to find $\log._{\epsilon}(1{\cdot}1)$ make $k = {\cdot}1$, then

$$\text{Log.}_{\epsilon}(1{\cdot}1) = {\cdot}1 - \frac{{\cdot}01}{2} + \frac{{\cdot}001}{3} - \frac{{\cdot}0001}{4} + \frac{{\cdot}00001}{5} - \frac{{\cdot}000001}{6} + \cdots\cdots\cdots$$

These terms may be extended as far as necessary and when arranged for summation the following results are obtained:—

+	·1	—	·005
	·00033333333333		000025
	·00000200000000		·00000016666667
	·00000001428571		·00000000125000
	·00000000011111		·00000000001000
	·00000000000091		·00000000000008
+	·10033534773106	—	·00502516792675

Whence $\text{Log.}_{\epsilon}(1{\cdot}1) = ({\cdot}10033534773106 - {\cdot}00502516792675) = 0{\cdot}09531017980431$.

This result, which is the natural or Naperian logarithm, is correct to the thirteenth decimal inclusive, and if multiplied by the modulus ·434294481903, will be reduced to the ordinary base. Therefore

$$\lambda.(1+r) = \lambda.(1{\cdot}1) = (0{\cdot}09531017980431 \times {\cdot}43429448903) = 0{\cdot}041392685158$$

and $\lambda.v = \lambda\cdot\left(\frac{1}{1+r}\right) = \lambda\cdot\left(\frac{1}{1{\cdot}1}\right) = 9{\cdot}958607314842$, which agrees exactly with the value given in page 532, and also that in Table **15** following.

To find $\text{Log.}_{\epsilon}(1{\cdot}07)$ make $k = {\cdot}07$ and

$$\text{Log.}_{\epsilon}(1{\cdot}07) = {\cdot}07 - \frac{{\cdot}0049}{2} + \frac{{\cdot}000343}{3} - \frac{{\cdot}00002401}{4} + \frac{0000016807}{5} - \cdots\cdots\cdots$$

the summation of which produces

+	·07	—	·00245
	·000114333333		·0000060025
	·000000336140		·00000001960817
	·00000000117649		·00000000007206
	·00000000000448		·00000000000028
+	·07011467065397	—	·00245602218051

and $\text{Log.}_{\epsilon}(1{\cdot}07) = ({\cdot}07011467065397 - {\cdot}00245602218051) = 0{\cdot}06765864847346$

consequently

$$\lambda.(1+r) = \lambda.(1{\cdot}07) = (0{\cdot}06765864847346 \times {\cdot}434294481903) = 0{\cdot}029383777685$$

$$\text{and } \lambda.v = \lambda\cdot\left(\frac{1}{1+4}\right) = \lambda\cdot\left(\frac{1}{1\,07}\right) = 9{\cdot}970616222315.$$

This, it will be seen, has been determined correctly to twelve places of decimals by the employment of ten terms in the above series. If, however, eight terms only had

been employed the result would have been correct for eleven decimal places, and the twelfth place would have been two units only in error, producing 7 instead of 5 as above.

Again, to find $\text{Log.}_{\epsilon}(1{\cdot}03)$ make $k = {\cdot}03$ and

$$\text{Log.}_{\epsilon}(1{\cdot}03) = {\cdot}03 - \frac{{\cdot}0009}{2} + \frac{{\cdot}000027}{3} - \frac{{\cdot}00000081}{4} + \frac{{\cdot}0000000243}{5} - \frac{{\cdot}000000000729}{6} + \ldots\ldots$$

the summation of which gives

$$+\begin{cases} {\cdot}03 \\ {\cdot}000009 \\ {\cdot}00000000486 \end{cases} \qquad -\begin{cases} {\cdot}00045 \\ {\cdot}0000002025 \\ {\cdot}00000000012 \end{cases}$$

$$+ \quad {\cdot}03000900486 \qquad - \quad {\cdot}00045020262 \quad \text{and}$$

$$\text{Log.}_{\epsilon}(1{\cdot}03) = ({\cdot}03000900486 - {\cdot}00045020262) = 0{\cdot}02955880224, \quad \text{and hence}$$

$$\lambda.(1+r) = \lambda.(1{\cdot}03) = (0{\cdot}02955880224 \times {\cdot}434294481903) = 0{\cdot}012837224705\,; \text{ and therefore}$$

$$\lambda.v = \lambda.\left(\frac{1}{1+r}\right) = \lambda.\left(\frac{1}{1{\cdot}03}\right) = 9{\cdot}987162775295,$$

agreeing with the result in page 532, as well as with that in Table **15** following, although the calculation has been limited to six terms of the series only. It is therefore obvious that as the value of the fraction k diminishes the series becomes rapidly convergent. In the first of the preceding examples where $k = {\cdot}1$ the series consisted of twelve terms, but in the last, in which $k = {\cdot}03$ it was formed of six terms only, but it in each case gives $\lambda.v$ correct to twelve places.

Having in this manner found $\lambda.v$ for each rate of interest specified in page 532, the following Table, containing the logarithms to twelve places of decimals, of the present value of £1 due at the end of any number of years from one to 110 years, has been calculated for ten different rates of interest. As this Table is of extensive application in all matters connected with life contingencies every care has been taken to ensure its accuracy. It has been calculated in duplicate by the following formula, and as a further check on the results so obtained a third calculation was made by a different formula.

It will have been observed that $\lambda.v$ is simply the arithmetical complement of $\lambda.(1+r)$. These two values having, as already stated, been found for each rate of interest by the logarithmic formula given above, it will be seen that in the next Table

$$\lambda.v^{x} = \lambda.\frac{1}{(1+r)^{x}} = \lambda.\frac{1}{(1+r)^{x-1}} - \lambda.(1+r) \quad \text{or}$$

$$\lambda.v^{x-1} = \lambda.v^{x} + \lambda.(1+r)\,;$$

But $\lambda.(1+r)$ being constant its continuous addition to the initial $\lambda.v$ will produce the successive values in the different columns of the following Table:—

Table 15.

Log. of the Present Value of £.1, due at the end of any number of Years.

Years.	3 Per Cent.	3½ Per Cent.	4 Per Cent.	4½ Per Cent.	5 Per Cent.
1	9·9871627 75295	9·9850596 50207	9·9829666 60701	9·9808837 09553	9·9788107 00930
2	·9743255 50590	·9701193 00414	·9659333 21402	·9617674 19106	·9576214 01860
3	·9614883 25885	·9551789 50621	·9488999 82103	·9426511 28659	·9364321 02790
4	·9486511 01180	·9402386 00828	·9318666 42804	·9235348 38212	·9152428 03720
5	·9358138 76475	·9252982 51035	·9148333 03505	·9044185 47765	·8940535 04650
6	·9229766 51770	·9103579 01242	·8977999 64206	·8853022 57318	·8728642 05580
7	·9101394 27065	·8954175 51449	·8807666 24907	·8661859 66871	·8516749 06510
8	·8973022 02360	·8804772 01656	·8637332 85608	·8470696 76424	·8304856 07440
9	·8844649 77655	·8655368 51863	·8466999 46309	·8279533 85977	·8092963 08370
10	·8716277 52950	·8505965 02070	·8296666 07010	·8088370 95530	·7881070 09300
11	·8587905 28245	·8356561 52277	·8126332 67711	·7897208 05083	·7669177 10230
12	·8459533 03540	·8207158 02484	·7955999 28412	·7706045 14636	·7457284 11160
13	·8331160 78835	·8057754 52691	·7785665 89113	·7514882 24189	·7245391 12090
14	·8202788 54130	·7908351 02898	·7615332 49814	·7323719 33742	·7033498 13020
15	·8074416 29425	·7758947 53105	·7444999 10515	·7132556 43295	·6821605 13950
16	·7946044 04720	·7609544 03312	·7274665 71216	·6941393 52848	·6609712 14880
17	·7817671 80015	·7460140 53519	·7104332 31917	·6750230 62401	·6397819 15810
18	·7689299 55310	·7310737 03726	·6933998 92618	·6559067 71954	·6185926 16740
19	·7560927 30605	·7161333 53933	·6763665 53319	·6367904 81507	·5974033 17670
20	·7432555 05900	·7011930 04140	·6593332 14020	·6176741 91060	·5762140 18600
21	·7304182 81195	·6862526 54347	·6422998 74721	·5985579 00613	·5550247 19530
22	·7175810 56490	·6713123 04554	·6252665 35422	·5794416 10166	·5338354 20460
23	·7047438 31785	·6563719 54761	·6082331 96123	·5603253 19719	·5126461 21390
24	·6919066 07080	·6414316 04968	·5911998 56824	·5412090 29272	·4914568 22320
25	·6790693 82375	·6264912 55175	·5741665 17525	·5220927 38825	·4702675 23250
26	·6662321 57670	·6115509 05382	·5571331 78226	·5029764 48378	·4490782 24180
27	·6533949 32965	·5966105 55589	·5400998 38927	·4838601 57931	·4278889 25110
28	·6405577 08260	·5816702 05796	·5230664 99628	·4647438 67484	·4066996 26040
29	·6277204 83555	·5667298 56003	·5060331 60329	·4456275 77037	·3855103 26970
30	·6148832 58850	·5517895 06210	·4889998 21030	·4265112 86590	·3643210 27900
31	·6020460 34145	·5368491 56417	·4719664 81731	·4073949 96143	·3431317 28830
32	·5892088 09440	·5219088 06624	·4549331 42432	·3882787 05696	·3219424 29760
33	·5763715 84735	·5069684 56831	·4378998 03133	·3691624 15249	·3007531 30690
34	·5635343 60030	·4920281 07038	·4208664 63834	·3500461 24802	·2795638 31620
35	·5506971 35325	·4770877 57245	·4038331 24535	·3309298 34355	·2583745 32550
36	·5378599 10620	·4621474 07452	·3867997 85236	·3118135 43908	·2371852 33480
37	·5250226 85915	·4472070 57659	·3697664 45937	·2926972 53461	·2159959 34410
38	·5121854 61210	·4322667 07866	·3527331 06638	·2735809 63014	·1948066 35340
39	·4993482 36505	·4173263 58073	·3356997 67339	·2544646 72567	·1736173 36270
40	·4865110 11800	·4023860 08280	·3186664 28040	·2353483 82120	·1524280 37200
41	·4736737 87095	·3874456 58487	·3016330 88741	·2162320 91673	·1312387 38130
42	·4608365 62390	·3725053 08694	·2845997 49442	·1971158 01226	·1100494 39060
43	·4479993 37685	·3575649 58901	·2675664 10143	·1779995 10779	·0888601 39990
44	·4351621 12980	·3426246 09108	·2505330 70844	·1588832 20332	·0676708 40920
45	·4223248 88275	·3276842 59315	·2334997 31545	·1397669 29885	·0464815 41850
46	·4094876 63570	·3127439 09522	·2164663 92246	·1206506 39438	·0252922 42780
47	·3966504 38865	·2978035 59729	·1994330 52947	·1015343 48991	9·0041029 43710
48	·3838132 14160	·2828632 09936	·1823997 13648	·0824180 58544	8·9829136 44640
49	·3709759 89455	·2679228 60143	·1653663 74349	·0633017 68097	·9617243 45570
50	·3581387 64750	·2529825 10350	·1483330 35050	·0441854 77650	·9405350 46500
51	·3453015 40045	·2380421 60557	·1312996 95751	·0250691 87203	·9193457 47430
52	·3324643 15340	·2231018 10764	·1142663 56452	9·0059528 96756	·8981564 48360
53	·3196270 90635	·2081614 60971	·0972330 17153	8·9868366 06309	·8769671 49290
54	·3067898 65920	·1932211 11178	·0801996 77854	·9677203 15862	·8557778 50220
55	9·2939526 41225	9·1782807 61385	9·0631663 38555	8·9486040 25415	8·8345885 51150

Log. of the Present Value of £.1, due at the end of any number of Years.

YEARS.	3 PER CENT.	3½ PER CENT.	4 PER CENT.	4½ PER CENT.	5 PER CENT.
56	9·2811154 16520	9·1633404 11592	9·0461329 99256	8·9294877 34968	8·8133992 52080
57	·2682781 91815	·1484000 61799	·0290996 59957	·9103714 44521	·7922099 53010
58	·2554409 67110	·1334597 12006	9·0120663 20658	·8912551 54074	·7710206 53940
59	·2426037 42405	·1185193 62213	8·9950329 81359	·8721388 63627	·7498313 54870
60	·2297665 17700	·1035790 12420	·9779996 42060	·8530225 73180	·7286420 55800
61	·2169292 92995	·0886386 62627	·9609663 02761	·8339062 82733	·7074527 56730
62	·2040920 68290	·0736983 12834	·9439329 63462	·8147899 92286	·6862634 57660
63	·1912548 43585	·0587579 63041	·9268996 24163	·7956737 01839	·6650741 58590
64	·1784176 18880	·0438176 13248	·9098662 84864	·7765574 11392	·6438848 59520
65	·1655803 94175	·0288772 63455	·8928329 45565	·7574411 20945	·6226955 60450
66	·1527431 69470	9·0139369 13662	·8757996 06266	·7383248 30498	·6015062 61380
67	·1399059 44765	8·9989965 63869	·8587662 66967	·7192085 40051	·5803169 62310
68	·1270687 20060	·9840562 14076	·8417329 27668	·7000922 49604	·5591276 63240
69	·1142314 95355	·9691158 64283	·8246995 88369	·6809759 59175	·5379383 64170
70	·1013942 70650	·9541755 14490	·8076662 49070	·6618596 68710	·5167490 65100
71	·0885570 45945	·9392351 64697	·7906329 09771	·6427433 78263	·4955597 66030
72	·0757198 21240	·9242948 14904	·7735995 70472	·6236270 87816	·4743704 66960
73	·0628825 96535	·9093544 65111	·7565662 31173	·6045107 97369	·4531811 67890
74	·0500453 71830	·8944141 15318	·7395328 91874	·5853945 06922	·4319918 68820
75	·0372081 47125	·8794737 65525	·7224995 52575	·5662782 16475	·4108025 69750
76	·0243709 22420	·8645334 15732	·7054662 13276	·5471619 26028	·3896132 70680
77	9·0115336 97715	·8495930 65939	·6884328 73977	·5280456 35581	·3684239 71610
78	8·9986964 73010	·8346527 16146	·6713995 34678	·5089293 45134	·3472346 72540
79	·9858592 48305	·8197123 66353	·6543661 95379	·4898130 54687	·3260453 73470
80	·9730220 23600	·8047720 16560	·6373328 56080	·4706967 64240	·3048560 74400
81	·9601847 98895	·7898316 66767	·6202995 16781	·4515804 73793	·2836667 75330
82	·9473475 74190	·7748913 16974	·6032661 77482	·4324641 83346	·2624774 76260
83	·9345103 49485	·7599509 67181	·5862328 38183	·4133478 92899	·2412881 77190
84	·9216731 24780	·7450106 17388	·5691994 98884	·3942316 02452	·2200988 78120
85	·9088359 00075	·7300702 67595	·5521661 59585	·3751153 12005	·1989095 79050
86	·8959986 75370	·7151299 17802	·5351328 20286	·3559990 21558	·1777202 79980
87	·8831614 50665	·7001895 68009	·5180994 80987	·3368827 31111	·1565309 80910
88	·8703242 25960	·6852492 18216	·5010661 41688	·3177664 40664	·1353416 81840
89	·8574870 01255	·6703088 68423	·4840328 02389	·2986501 50217	·1141523 82770
90	·8446497 76550	·6553685 18630	·4669994 63090	·2795338 59770	·0929630 83700
91	·8318125 51845	·6404281 68837	·4499661 23791	·2604175 69323	·0717737 84630
92	·8189753 27140	·6254878 19044	·4329327 84492	·2413012 78876	·0505844 85560
93	·8061381 02435	·6105474 69251	·4158994 45193	·2221849 88429	·0293951 86490
94	·7933008 77730	·5956071 19458	·3988661 05894	·2030686 97982	8·0082058 87420
95	·7804636 53025	·5806667 69665	·3818327 66595	·1839524 07535	7·9870165 88350
96	·7676264 28320	·5657264 19872	·3647994 27296	·1648361 17088	·9658272 89280
97	·7547892 03615	·5507860 70079	·3477660 87997	·1457198 26641	·9446379 90210
98	·7419519 78910	·5358457 20286	·3307327 48698	·1266035 36194	·9234486 91140
99	·7291147 54205	·5209053 70493	·3136994 09399	·1074872 45747	·9022593 92070
100	·7162775 29500	·5059650 20700	·2966660 70100	·0883709 55300	·8810700 93000
101	·7034403 04795	·4910246 70907	·2796327 30801	·0692546 64853	·8598807 93930
102	·6906030 80090	·4760843 21114	·2625993 91502	·0501383 74406	·8386914 94860
103	·6777658 55385	·4611439 71321	·2455660 52203	·0310220 83959	·8175021 95790
104	·6649286 30680	·4462036 21528	·2285327 12904	8·0119057 93512	·7963128 96720
105	·6520914 05975	·4312632 71735	·2114993 73605	7·9927895 03065	·7751235 97650
106	·6392541 81270	·4163229 21942	·1944660 34306	·9736732 12618	·7539342 98580
107	·6264169 56565	·4013825 72149	·1774326 95007	·9545569 22171	·7327449 99510
108	·6135797 31860	·3864422 22356	·1603993 55708	·9354406 31724	·7115557 00440
109	·6007425 07155	·3715018 72563	·1433660 16409	·9163243 41277	·6903664 01370
110	8·5879052 82450	8·3565615 22770	8·1263326 77110	7·8972080 50830	7·6691771 02300

Log. of the Present Value of £.1, due at the end of any number of Years.

YEARS.	6 PER CENT.	7 PER CENT.	8 PER CENT.	9 PER CENT.	10 PER CENT.
1	9·9746941 34735	9·9706162 22315	9·9665762 44513	9·9625735 02059	9·9586073 14842
2	·9493882 69470	·9412324 44630	·9331524 89026	·9251470 04118	·9172146 29684
3	·9240824 04205	·9118486 66945	·8997287 33539	·8877205 06177	·8758219 44526
4	·8987765 38940	·8824648 89260	·8663049 78052	·8502940 08236	·8344292 59368
5	·8734706 73675	·8530811 11575	·8328812 22565	·8128675 10295	·7930365 74210
6	·8481648 08410	·8236973 33890	·7994574 67078	·7754410 12354	·7516438 89052
7	·8228589 43145	·7943135 56205	·7660337 11591	·7380145 14413	·7102512 03894
8	·7975530 77880	·7649297 78520	·7326099 56104	·7005880 16472	·6688585 18736
9	·7722472 12615	·7355460 00835	·6991862 00617	·6631615 18531	·6274658 33578
10	·7469413 47350	·7061622 23150	·6657624 45130	·6257350 20590	·5860731 48420
11	·7216354 82085	·6767784 45465	·6323386 89643	·5883085 22649	·5446804 63262
12	·6963296 16820	·6473946 67780	·5989149 34156	·5508820 24708	·5032877 78104
13	·6710237 51555	·6180108 90095	·5654911 78669	·5134555 26767	·4618950 92946
14	·6457178 86290	·5886271 12410	·5320674 23182	·4760290 28826	·4205024 07788
15	·6204120 21025	·5592433 34725	·4986436 67695	·4386025 30885	·3791097 22630
16	·5951061 55760	·5298595 57040	·4652199 12208	·4011760 32944	·3377170 37472
17	·5698002 90495	·5004757 79355	·4317961 56721	·3637495 35003	·2963243 52314
18	·5444944 25230	·4710920 01670	·3983724 01234	·3263230 37062	·2549316 67156
19	·5191885 59965	·4417082 23985	·3649486 45747	·2888965 39121	·2135389 81998
20	·4938826 94700	·4123244 46300	·3315248 90260	·2514700 41180	·1721462 96840
21	·4685768 29435	·3829406 68615	·2981011 34773	·2140435 43239	·1307536 11682
22	·4432709 64170	·3535568 90930	·2646773 79286	·1766170 45298	·0893609 26524
23	·4179650 98905	·3241731 13245	·2312536 23799	·1391905 47357	·0479682 41366
24	·3926592 33640	·2947893 35560	·1978398 68312	·1017640 49416	9·0065755 56208
25	·3673533 68375	·2654055 57875	·1644061 12825	·0643375 51475	8·9651828 71050
26	·3420475 03110	·2360217 80190	·1309823 57338	9·0269110 53534	·9237901 85892
27	·3167416 37845	·2066380 02505	·0975586 01851	8·9894845 55593	·8823975 00734
28	·2914357 72580	·1772542 24820	·0641348 46364	·9520580 57652	·8410048 15576
29	·2661299 07315	·1478704 47135	9·0307110 90877	·9146315 59711	·7996121 30418
30	·2408240 42050	·1184866 69450	8·9972873 35390	·8772050 61770	·7582194 45260
31	·2155181 76785	·0891028 91765	·9638635 79903	·8397785 63829	·7168267 60102
32	·1902123 11520	·0597191 14080	·9304398 24416	·8023520 65888	·6754340 74944
33	·1649064 46255	·0303353 36395	·8970160 68929	·7649255 67947	·6340413 89786
34	·1396005 80990	9·0009515 58710	·8635923 13442	·7274990 70006	·5926487 04628
35	·1142947 15725	8·9715677 81025	·8301685 57955	·6900725 72065	·5512560 19470
36	·0889888 50460	·9421840 03340	·7967448 02468	·6526460 74124	·5098633 34312
37	·0636829 85195	·9128002 25655	·7633210 46981	·6152195 76183	·4684706 49154
38	·0383771 19930	·8834164 47970	·7298972 91494	·5777930 78242	·4270779 63996
39	9·0130712 54665	·8540326 70285	·6964735 36007	·5403665 80301	·3856852 78838
40	8·9877653 89400	·8246488 92600	·6630497 80520	·5029400 82360	·3442925 93680
41	·9624595 24135	·7952651 14915	·6296260 25033	·4655135 84419	·3028999 08522
42	·9371536 58870	·7658813 37230	·5962022 69546	·4280870 86478	·2615072 23364
43	·9118477 93605	·7364975 59545	·5627785 14059	·3906605 88537	·2201145 38206
44	·8865419 28340	·7071137 81860	·5293547 58572	·3532340 90596	·1787218 53048
45	·8612360 63075	·6777300 04175	·4959310 03085	·3158075 92655	·1373291 67890
46	·8359301 97810	·6483462 26490	·4625072 47598	·2783810 94714	·0959364 82732
47	·8106243 32545	·6189624 48805	·4290834 92111	·2409545 96773	·0545437 97574
48	·7853184 67280	·5895786 71120	·3956597 36624	·2035280 98832	8·0131511 12416
49	·7600126 02015	·5601948 93435	·3622359 81137	·1661016 00891	7·9717584 27258
50	·7347067 36750	·5308111 15750	·3288122 25650	·1286751 02950	·9303657 42100
51	·7094008 71485	·5014273 38065	·2953884 70163	·0912486 05009	·8889730 56942
52	·6840950 06220	·4720435 60380	·2619647 14676	·0538221 07068	·8475803 71784
53	·6587891 40955	·4426597 82695	·2285409 59189	8·0163956 09127	·8061876 86626
54	·6334832 75690	·4132760 05010	·1951172 03702	7·9789691 11186	·7647950 01468
55	8·6081774 10425	8·3838922 27325	8·1616934 48215	7·9415426 13245	7·7234023 16310

TABLE 15—(*continued*).

Log. of the Present Value of £.1, due at the end of any number of Years.

YEARS.	6 PER CENT.		7 PER CENT.		8 PER CENT.		9 PER CENT.		10 PER CENT.	
56	8·5828715	45160	8·3545084	49640	8·1282696	92728	7·9041161	15304	7·6820096	31152
57	·5575656	79895	·3251246	71955	·0948459	37241	·8666896	17363	·6406169	45994
58	·5322598	14630	·2957408	94270	·0614221	81754	·8292631	19422	·5992242	60836
59	·5069539	49365	·2663571	16585	8·0279984	26267	·7918366	21481	·5578315	75678
60	·4816480	84100	·2369733	38900	7·9945746	70780	·7544101	23540	·5164388	90520
61	·4563422	18835	·2075895	61215	·9611509	15293	·7169836	25599	·4750462	05362
62	·4310363	53570	·1782057	83530	·9277271	59806	·6795571	27658	·4336535	20204
63	·4057304	88305	·1488220	05845	·8943034	04319	·6421306	29717	·3922608	35046
64	·3804246	23040	·1194382	28160	·8608796	48832	·6047041	31776	·3508681	49888
65	·3551187	57775	·0900544	50475	·8274558	93345	·5672776	33835	·3094754	64730
66	·3298128	92510	·0606706	72790	·7940321	37858	·5298511	35894	·2680827	79572
67	·3045070	27245	·0312868	95105	·7606083	82371	·4924246	37953	·2266900	94414
68	·2792011	61980	8·0019031	17420	·7271846	26884	·4549981	40012	·1852974	09256
69	·2538952	96715	7·9725193	39735	·6937608	71397	·4175716	42071	·1439047	24098
70	·2285894	31450	·9431355	62050	·6603371	15910	·3801451	44130	·1025120	38940
71	·2032835	66185	·9137517	84365	·6269133	60423	·3427186	46189	·0611193	53782
72	·1779777	00920	·8843680	06680	·5934896	04936	·3052921	48248	7·0197266	68624
73	·1526718	35655	·8549842	28995	·5600658	49449	·2678656	50307	6·9783339	83466
74	·1273659	70390	·8256004	51310	·5266420	93962	·2304391	52366	·9369412	98308
75	·1020601	05125	·7962166	73625	·4932183	38475	·1930126	54425	·8955486	13150
76	·0767542	39860	·7668328	95940	·4597945	82988	·1555861	56484	·8541559	27992
77	·0514483	74595	·7374491	18255	·4263708	27501	·1181596	58543	·8127632	42834
78	·0261425	09330	·7080653	40570	·3929470	72014	·0807331	60602	·7713705	57676
79	8·0008366	44065	·6786815	62885	·3595233	16527	·0433066	62661	·7299778	72518
80	7·9755307	78800	·6492977	85200	·3260995	61040	7·0058801	64720	·6885851	87360
81	·9502249	13535	·6199140	07515	·2926758	05553	6·9684536	66779	·6471925	02202
82	·9249190	48270	·5905302	29830	·2592520	50066	·9310271	68838	·6057998	17044
83	·8996131	83005	·5611464	52145	·2258282	94579	·8936006	70897	·5644071	31886
84	·8743073	17740	·5317626	74460	·1924045	39092	·8561741	72956	·5230144	46728
85	·8490014	52475	·5023788	96775	·1589807	83605	·8187476	75015	·4816217	61570
86	·8236955	87210	·4729951	19090	·1255570	28118	·7813211	77074	·4402290	76412
87	·7983897	21945	·4436113	41405	·0921332	72631	·7438946	79133	·3988363	91254
88	·7730838	56680	·4142275	63720	·0587095	17144	·7064681	81192	·3574437	06096
89	·7477779	91415	·3848437	86035	7·0252857	61657	·6690416	83251	·3160510	20938
90	·7224721	26150	·3554600	08350	6·9918620	06170	·6316151	85310	·2746583	35780
91	·6971662	60885	·3260762	30665	·9584382	50683	·5941886	87369	·2332656	50622
92	·6718603	95620	·2966924	52980	·9250144	95196	·5567621	89428	·1918729	65464
93	·6465545	30355	·2673086	75295	·8915907	39709	·5193356	91487	·1504802	80306
94	·6212486	65090	·2379248	97610	·8581669	84222	·4819091	93546	·1090875	95148
95	·5959427	99825	·2085411	19925	·8247432	28735	·4444826	95605	·0676949	09990
96	·5706369	34560	·1791573	42240	·7913194	73248	·4070561	97664	6·0263022	24832
97	·5453310	69295	·1497735	64555	·7578957	17761	·3696296	99723	5·9849095	39674
98	·5200252	04030	·1203897	86870	·7244719	62274	·3322032	01782	·9435168	54516
99	·4947193	38765	·0910060	09185	·6910482	06787	·2947767	03841	·9021241	69358
100	·4694134	73500	·0616222	31500	·6576244	51300	·2573502	05900	·8607314	84200
101	·4441076	08235	·0322384	53815	·6242006	95813	·2199237	07959	·8193387	99042
102	·4188017	42970	7·0028546	76130	·5907769	40326	·1824972	10018	·7779461	13884
103	·3934958	77705	6·9734708	98445	·5573531	84839	·1450707	12077	·7365534	28726
104	·3681900	12440	·9440871	20760	·5239294	29352	·1076442	14136	·6951607	43568
105	·3428841	47175	·9147033	43075	·4905056	73865	·0702177	16195	·6537680	58410
106	·3175782	81910	·8853195	65390	·4570819	18378	6·0327912	18254	·6123753	73252
107	·2922724	16645	·8559357	87705	·4236581	62891	5·9953647	20313	·5709826	88094
108	·2669665	51380	·8265520	10020	·3902344	07404	·9579382	22372	·5295900	02936
109	·2416606	86115	·7971682	32335	·3568106	51917	·9205117	24431	·4881973	17778
110	7·2163548	20850	6·7677844	54650	6·3233868	96430	5·8830852	26490	5·4468046	32620

TABLE 16.

Friendly Societies.—England and Wales.—Three Districts.—Three per Cent.

Age x.	$\lambda . D_x$	D_x	$\lambda . N_x$	N_x	$\lambda . N^s_x$	N^s_x	Age x.
10	4·8716278	74409·40	6·2583604	1812843·88	6·5274486	3368694·15	10
11	·8577034	72061·52	·2407445	1740782·36	·5230358	3334539·13	11
12	·8437807	69788·00	·2229749	1670994·36	·5178116	3294667·43	12
13	·8297854	67574·90	·2050472	1603419·46	·5119609	3250580·65	13
14	·8156420	65409·68	·1869591	1538009·78	·5056479	3203671·01	14
15	·8012789	63281·81	·1687119	1474727·97	·4990282	3155209·84	15
16	·7866231	61181·91	·1503099	1413546·06	·4922537	3106373·72	16
17	·7715995	59101·64	·1317611	1354444·42	·4854727	3058247·94	17
18	·7562789	57053·05	·1130710	1297391·37	·4787084	3010984·09	18
19	·7407325	55046·85	·0942421	1242344·52	·4719852	2964723·32	19
20	·7250333	53092·51	·0752739	1189252·01	·4653203	2919579·45	20
21	·7092514	51197·81	·0561630	1138054·20	·4587363	2875651·25	21
22	·6934585	49369·48	·0369021	1088684·72	·4522486	2833013·28	22
23	·6776452	47604·20	6·0174843	1041080·52	·4458526	2791596·41	23
24	·6618115	45899·87	5·9979019	995180·65	·4395429	2751332·15	24
25	·6459476	44253·50	·9781473	950927·15	·4333162	2712165·74	25
26	·6300531	42663·17	·9582121	908263·98	·4271683	2674042·33	26
27	·6141177	41126·11	·9380881	867137·87	·4210954	2636910·65	27
28	·5981363	39640·25	·9177667	827497·62	·4151051	2600788·53	28
29	·5821078	38203·91	·8972387	789293·71	·4092036	2565686·39	29
30	·5660265	36815·14	·8764941	752478·57	·4033977	2531615·27	30
31	·5498913	35472·46	·8555229	717006·11	·3976938	2498583·19	31
32	·5336964	34174·05	·8343139	682832·06	·3920972	2466591·56	32
33	·5174406	32918·55	·8128555	649913·51	·3865788	2435447·70	33
34	·5011225	31704·61	·7911352	618208·90	·3811107	2404974·52	34
35	·4847358	30530·64	·7691396	587678·26	·3756665	2375015·99	35
36	·4682791	29395·38	·7468544	558282·88	·3702224	2345429·84	36
37	·4517509	28297·69	·7242638	529985·19	·3647559	2316092·37	37
38	·4351392	27235·74	·7013515	502749·45	·3592456	2286891·37	38
39	·4184315	26207·85	·6781009	476541·60	·3536713	2257726·31	39
40	·4016205	25212·77	·6544931	451328·83	·3480157	2228515·50	40
41	·3846875	24248·65	·6305094	427080·18	·3421267	2198501·00	41
42	·3676240	23314·39	·6061295	403765·79	·3362575	2168989·30	42
43	·3504156	22408·65	·5813319	381357·14	·3302653	2139268·62	43
44	·3330475	21530·17	·5560937	359826·97	·3241426	2109320·50	44
45	·3155039	20677·78	·5303908	339149·19	·3178820	2079131·58	45
46	·2977739	19850·61	·5041970	319298·58	·3114779	2048697·55	46
47	·2798461	19047·86	·4774840	300250·72	·3049247	2018016·11	47
48	·2616796	18267·53	·4502232	281983·19	·2981977	1986999·05	48
49	·2432430	17508·26	·4223845	264474·93	·2912741	1955573·50	49
50	·2245029	16768·83	·3939367	247706·10	·2841342	1923686·03	50
51	·2054238	16048·11	·3648473	231657·99	·2767604	1891299·86	51
52	·1859739	15345·25	·3350821	216312·74	·2691379	1858394·11	52
53	·1661250	14659·69	·3046048	201653·05	·2612367	1824890·05	53
54	·1458592	13991·34	·2733756	187661·71	·2530306	1790732·23	54
55	4·1251567	13340·03	5·2413514	174321·68	6·2444964	1755886·21	55

TABLE 16—(*continued*).

Friendly Societies.—England and Wales.—Three Districts.—Three per Cent.

Age x.	$\lambda . D_x$	D_x	$\lambda . N_x$	N_x	$\lambda . N^s_x$	N^s_x	Age x.
55	4·1251567	13340·03	5·2413514	174321·68	6·2444964	1755886·21	55
56	·1039958	12705·62	·2084845	161616·06	·2356139	1720338·64	56
57	·0823526	12087·94	·1747228	149528·12	·2261480	1683247·63	57
58	·0602004	11486·84	·1400090	138041·28	·2164000	1645886·92	58
59	·0375098	10902·09	·1042794	127139·19	·2060368	1607077·25	59
60	4·0142483	10333·52	·0674639	116805·67	·1949471	1566560·12	60
61	3·9903939	9781·24	5·0294829	107024·43	·1830277	1524149·90	61
62	·9659147	9245·17	4·9902468	97779·26	·1701812	1479725·72	62
63	·9406510	8722·70	·9496660	89056·56	·1560791	1432448·75	63
64	·9144554	8212·12	·9076502	80844·44	·1404083	1381682·60	64
65	·8871685	7712·03	·8641099	73132·41	·1228660	1326984·98	65
66	·8586240	7221·44	·8189577	65910·97	·1031533	1268099·28	66
67	·8286727	6740·20	·7721072	59170·77	·0809686	1204948·98	67
68	·7971196	6267·87	·7234795	52902·90	·0561774	1138092·13	68
69	·7637708	5804·58	·6730054	47098·32	6·0286336	1068153·23	69
70	·7284220	5350·84	·6206303	41747·48	5·9981782	995813·85	70
71	·6908775	4907·69	·5663171	36839·79	·9646381	921803·00	71
72	·6509307	4476·42	·5100538	32363·37	·9278237	846883·49	72
73	·6087956	4062·52	·4517995	28300·85	·8876525	772062·42	73
74	·5646728	3670·06	·3914783	24630·79	·8439887	698214·17	74
75	·5187797	3302·02	·3289658	21328·77	·7966266	626075·29	75
76	·4713272	2960·24	·2640744	18368·53	·7452632	556241·27	76
77	·4225301	2645·63	·1965326	15722·90	·6894621	489172·64	77
78	·3718844	2354·41	·1260823	13368·49	·6292167	425810·80	78
79	·3188831	2083·93	4·0524847	11284·56	·5645286	366883·89	79
80	·2630121	1832·36	3·9755329	9452·20	·4954412	312925·68	80
81	·2036197	1598·16	·8950931	7854·04	·4220813	264290·35	81
82	·1403887	1381·62	·8110666	6472·42	·3447372	221175·50	82
83	·0737595	1185·11	·7232348	5287·31	·2629038	183190·86	83
84	3·0043149	1009·98	·6311728	4277·33	·1758139	149904·25	84
85	2·9326232	856·29	·5341582	3421·04	5·0822675	120855·78	85
86	·8592670	723·21	·4310146	2697·83	4·9803780	95582·43	86
87	·7848922	609·39	·3198220	2088·44	·8670686	73632·33	87
88	·7064583	508·70	·1985856	1579·74	·7400579	54961·41	88
89	·6209150	417·75	3·0652024	1161·99	·5966307	39503·058	89
90	·5249853	334·95	2·9175265	827·04	·4336034	27139·588	90
91	·4152381	260·16	·7534911	566·88	·2473214	17673·454	91
92	·2877656	193·98	·5715924	372·90	4·0337961	10809·264	92
93	2·1405919	138·23	·3704576	234·67	3·7883009	6141·874	93
94	1·9740001	94·19	2·1476145	140·48	·5050335	3199·142	94
95	·7869297	61·23	1·8989993	79·25	3·1752630	1497·142	95
96	·5778589	37·83	·6172101	41·42	2·7876460	613·262	96
97	·3458538	22·17	1·2844307	19·25	2·3502596	224 006	97
98	1·0723658	11·81	0·8715729	7·44	1·8378282	68·837	98
99	0·7334362	5·41	0·3074960	2·03	1·1856555	15·334	99
100	0·3073421	2·03	...	0·00	0·6212802	4·181	100

Table 17.

Friendly Societies.—England and Wales.—Three Districts.—Three-and-half per Cent.

Age x.	$\lambda . D_x$	D_x	$\lambda . N_x$	N_x	$\lambda . N^s_x$	N^s_x	Age x.
10	4·8505965	70891·88	6·1951873	1567426·96	6·4205572	2633645·06	10
11	·8345691	68323·35	·1758317	1499103·61	·4151711	2601184·60	11
12	·8185432	65848·09	·1563237	1433255·52	·4088289	2563474·15	12
13	·8024448	63451·93	·1366584	1369803·59	·4017414	2521978·54	13
14	·7861982	61122·08	·1168340	1308681·51	·3941082	2478039·27	14
15	·7697321	58848·05	·0968522	1249833·46	·3861182	2432866·00	15
16	·7529730	56620·41	·0767180	1193213·05	·3779549	2387563·14	16
17	·7358464	54431·01	·0564407	1138782·04	·3697973	2343134·92	17
18	·7184226	52290·48	·0360263	1086491·56	·3616737	2299713·16	18
19	·7007732	50208·04	6·0154787	1036283·52	·3536120	2257418·27	19
20	·6829708	48191·53	5·9947974	988091·99	·3456371	2216343·91	20
21	·6650858	46247·23	·9739793	941844·76	·3377723	2176568·73	21
22	·6471897	44380·24	·9530173	897464·52	·3300378	2138148·30	22
23	·6292734	42586·65	·9319041	854877·87	·3224279	2101008·47	23
24	·6113365	40863·58	·9106320	814014·29	·3149362	2065076·65	24
25	·5933695	39207·53	·8891934	774806·76	·3075588	2030293·41	25
26	·5753718	37615·93	·8675799	737190·83	·2935835	1996599·99	26
27	·5573334	36085·56	·8457833	701105·27	·2931286	1963941·61	27
28	·5392488	34613·76	·8237946	666491·51	·2860801	1932324·64	28
29	·5211172	33198·41	·8016048	633293·10	·2791531	1901748·94	29
30	·5029327	31837·04	·7792039	601456·06	·2723556	1872214·61	30
31	·4846945	30527·73	·7565816	570928·33	·2656949	1843719·30	31
32	·4663964	29268·23	·7337269	541660·10	·2591769	1816254·85	32
33	·4480375	28056·76	·7106278	513603·34	·2527675	1789647·38	33
34	·4296162	26891·57	·6872719	486711·77	·2464342	1763738·66	34
35	·4111265	25770·72	·6636454	460941·05	·2401473	1738390·55	35
36	·3925666	24692·59	·6397339	436248·46	·2338786	1713478·44	36
37	·3739353	23655·67	·6155216	412592·79	·2276026	1688895·07	37
38	·3552204	22657·94	·5909921	389934·85	·2212953	1664544·26	38
39	·3364097	21697·50	·5661279	368237·35	·2149341	1640340·91	39
40	·3174955	20772·82	·5409105	347464·53	·2084996	1616216·70	40
41	·2984594	19881·97	·5153207	327582·56	·2019730	1592110·03	41
42	·2792927	19023·60	·4893381	308558·96	·1953384	1567972·25	42
43	·2599813	18196·22	·4629409	290362·74	·1885857	1543780·97	43
44	·2405100	17398·43	·4361059	272964·31	·1817071	1519522·32	44
45	·2208633	16628·89	·4088086	256335·42	·1746954	1495186·76	45
46	·2010301	15886·57	·3810408	240448·85	·1675454	1470772·14	46
47	·1809993	15170·48	·3527195	225278·37	·1602518	1446277·94	47
48	·1607296	14478·70	·3238609	210799·67	·1527883	1421635·43	48
49	·1401899	13809·88	·2944437	196989·79	·1451308	1396788·99	49
50	·1193466	13162·75	·2644094	183827·04	·1372588	1371699·13	50
51	·0981645	12536·16	·2337342	171290·88	·1291547	1346339·98	51
52	·0766114	11929·20	·2023839	159361·68	·1208037	1320698·46	52
53	·0546594	11341·21	·1703218	148020·47	·1121748	1294716·84	53
54	·0322904	10771·85	·1375080	137248·62	·1032412	1268356·20	54
55	4·0094849	10220·80	5·1038988	127027·82	6·0949797	1241594·37	55

TABLE 17—(*continued*).

Friendly Societies.—England and Wales.—Three Districts.—Three-and-half per Cent.

Age x.	$\lambda . D_x$	D_x	$\lambda . N_x$	N_x	$\lambda . N_x^s$	N_x^s	Age x.
55	4·0094849	10220·80	5·1038988	127027·82	6·0949797	1241594·37	55
56	3·9862208	9687·70	·0694466	117340·12	·0843709	1214425·63	56
57	·9624745	9172·22	5·0340984	108167·90	·0743981	1186856·38	57
58	·9382191	8673·99	4·9977965	99493·91	·0639249	1158577·10	58
59	·9134255	8192·67	·9604767	91301·24	·0528259	1129342·97	59
60	·8880608	7727·89	·9220678	83573·35	·0409859	1098970·11	60
61	·8621033	7279·53	·8824894	76293·82	·0282994	1067331·72	61
62	·8355209	6847·32	·8416504	69446·50	6·0146679	1034350·99	62
63	·8081542	6429·16	·7994600	63017·34	5·9997488	999421·91	63
64	·7798554	6023·59	·7558272	56993·75	·9832185	962096·14	64
65	·7504654	5629·44	·7106614	51364·31	·9647658	922074·06	65
66	·7198177	5245·87	·6638746	46118·44	·9440855	879195·69	66
67	·6877634	4872·63	·6153798	41245·81	·9208713	833434·17	67
68	·6541071	4509·28	·5650982	36736·53	·8949918	785220·76	68
69	·6186552	4155·81	·5129607	32580·72	·8663042	735028·40	69
70	·5812032	3812·44	·4589139	28768·28	·8346522	683364·09	70
71	·5415557	3479·81	·4029226	25288·47	·7998651	630761·41	71
72	·4995057	3158·68	·3449773	22129·79	·7617550	577770·11	72
73	·4552675	2852·78	·2850396	19277·01	·7202454	525104·12	73
74	·4090415	2564·73	·2230357	16712·28	·6752044	473374·00	74
75	·3610454	2296·39	·1588415	14415·89	·6264281	423085·41	75
76	·3114897	2048·75	·0922693	12367·14	·5736127	374638·73	76
77	·2605895	1822·17	4·0230453	10544·97	·5163176	328335·30	77
78	·2078406	1613·77	3·9509098	8931·20	·4545435	284802·31	78
79	·1527363	1421·47	·8756243	7509·73	·3883000	244511·93	79
80	·0947621	1243·83	·7969835	6265·90	·3176393	207797·05	80
81	3·0332666	1079·61	·7148568	5186·29	·2427001	174863·90	81
82	2·9679324	928·82	·6291516	4257·47	·1637872	145809·95	82
83	·8992002	792·87	·5396531	3464·60	5·0803984	120336·78	83
84	·8276524	672·44	·4459403	2792·16	4·9917665	98122·03	84
85	·7538576	567·36	·3472910	2224·80	·8966880	78829·37	85
86	·6783982	476·87	·2425240	1747·93	·7932668	62125·06	86
87	·6019203	399·87	·1297092	1348·06	·6784157	47688·73	87
88	·5213833	332·19	3·0068381	1015·87	·5498270	35467·21	88
89	·4337369	271·48	2·8718005	744·39	·4047899	25397·44	89
90	·3357040	216·62	·7224447	527·77	·2401152	17382·62	90
91	·2238537	167·44	·5567004	360·33	4·0521432	11275·69	91
92	2·0942781	124·24	·3730776	236·09	3·8368783	6868·76	92
93	1·9450013	88·11	2·1702030	147·98	·5895799	3886·69	93
94	·7763063	59·75	1·9456163	88·23	3·3044065	2015·61	94
95	·5871328	38·65	·6953065	49·58	2·9725083	938·66	95
96	·3759589	23·77	·4117880	25·81	·5836068	383·36	96
97	1·1418507	13·86	1·0773679	11·95	2·1443562	139·43	97
98	0·8662595	7·35	0·6627578	4·60	1·6300209	42·66	98
99	·5252268	3·35	0·0969100	1·25	0·9758911	9·46	99
100	0·0970296	1·25	...	0·00	0·4099331	2·57	100

TABLE 18.

Friendly Societies.—England and Wales.—Three Districts.—Four per Cent.

Age x.	$\lambda . D_x$	D_x	$\lambda . N_x$	N_x	$\lambda . N^s_x$	N^s_x	Age x.
10	4·8296667	67556·43	6·1348105	1363987·96	6·3199471	2089041·74	10
11	·8115462	64795·70	·1136735	1299192·26	·3134843	2058184·34	11
12	·7934274	62148·03	·0923852	1237044·23	·3058903	2022508·58	12
13	·7752360	59598·58	·0709409	1177445·65	·2974192	1983440·62	13
14	·7568964	57134·24	·0493388	1120311·41	·2883098	1942270·84	14
15	·7383373	54744·10	·0275809	1065567·31	·2787875	1900148·34	15
16	·7194853	52418·58	6·0056732	1013148·73	·2690710	1858108·09	16
17	·7002656	50149·38	5·9836261	962999·35	·2593735	1817077·69	17
18	·6807489	47945·61	·9614466	915053·74	·2497289	1777169·60	18
19	·6640065	45814·87	·9391391	869238·87	·2401707	1738484·06	19
20	·6411111	43763·40	·9167042	825475·47	·2307287	1701095·52	20
21	·6211330	41795·84	·8941385	783679·63	·2214306	1665063·64	21
22	·6011440	39915·73	·8714350	743763·90	·2123012	1630426·36	22
23	·5811346	38118·39	·8485866	705645·51	·2033333	1597104·54	23
24	·5611048	36400·28	·8255853	669245·23	·1945203	1565021·55	24
25	·5410448	34757·20	·8024234	634488·03	·1858575	1534113·42	25
26	·5209542	33185·95	·7790927	601302·08	·1773396	1504317·64	26
27	·5008228	31682·74	·7555847	569619·34	·1689616	1475576·01	27
28	·4806453	30244·42	·7318907	539374·92	·1607340	1447884·67	28
29	·4604206	28868·26	·7080014	510506·66	·1526656	1421233·99	29
30	·4401432	27551·37	·6839070	482955·29	·1447656	1395614·82	30
31	·4198120	26291·30	·6595968	456663·99	·1370425	1371015·77	31
32	·3994209	25085·39	·6350599	431578·60	·1295032	1347420·62	32
33	·3789690	23931·45	·6102844	407647·15	·1221082	1324671·61	33
34	·3584548	22827·32	·5852574	384819·83	·1148199	1302626·52	34
35	·3378720	21770·68	·5599654	363049·15	·1076041	1281162·13	35
36	·3172192	20759·61	·5343936	342289·54	·1004286	1260168·36	36
37	·2964949	19792·24	·5085261	322497·30	·0932545	1239551·22	37
38	·2756870	18866·31	·4823461	303630·99	·0860847	1219227·31	38
39	·2547833	17979·74	·4558361	285651·25	·0788639	1199123·59	39
40	·2337762	17130·74	·4289774	268520·51	·0715808	1179181·94	40
41	·2126470	16317·25	·4017507	252203·26	·0642148	1159350·59	41
42	·1913874	15537·72	·3741351	236665·54	·0567483	1139589·12	42
43	·1699830	14790·50	·3471085	221875·04	·0491711	1119879·06	43
44	·1484187	14074·04	·3176476	207801·00	·0414752	1100209·14	44
45	·1266790	13386·87	·2887278	194414·13	·0336536	1080571·72	45
46	·1047529	12727·79	·2593222	181686·34	·0257011	1060965·21	46
47	·0826290	12095·64	·2294020	169590·70	·0176131	1041389·37	47
48	·0602664	11488·58	·1989377	158102·12	·0093615	1021789·68	48
49	·0376337	10905·20	·1678987	147196·92	6·0009209	1002122·80	49
50	4·0146974	10344·21	·1362544	136852·71	5·9922701	982358·72	50
51	3·9914223	9804·43	·1039688	127048·28	·9833911	962478·56	51
52	·9677763	9284·88	·0710104	117763·40	·9742692	942473·68	52
53	·9437312	8784·79	·0373413	108978·61	·9648726	922300·91	53
54	·9192693	8303·66	5·0029214	100674·95	·9551739	901932·26	54
55	3·8943708	7840·99	4·9677069	92833·96	5·9451499	881353·03	55

TABLE 18—(*continued*).

Friendly Societies.—England and Wales.—Three Districts.—Four per Cent.

Age x.	$\lambda . D_x$	D_x	$\lambda . N_x$	N_x	$\lambda . N^s_x$	N^s_x	Age x.
55	3·8943708	7840·99	4·9677069	92833·96	5·9451499	881353·03	55
56	·8690137	7396·28	·9316495	85437·68	·9347819	860561·34	56
57	·8431744	6969·06	·8946960	78468·62	·9240541	839564·58	57
58	·8168261	6558·83	·8567879	71909·79	·9128226	818130·61	58
59	·7899394	6165·09	·8178607	65744·70	·9009564	796079·45	59
60	·7624818	5787·38	·7778422	59957·32	·8883365	773279·49	60
61	·7344313	5425·39	·7366508	54531·93	·8748549	749643·72	61
62	·7057559	5078·74	·6941943	49453·19	·8604121	725123·60	62
63	·6762962	4745·66	·6503806	44707·53	·8446510	699279·78	63
64	·6459045	4424·91	·6051177	40282·62	·8272370	671795·45	64
65	·6144214	4115·49	·5583141	36167·13	·8078511	642467·40	65
66	·5816808	3816·64	·5098809	32350·49	·7861814	611197·35	66
67	·5475335	3528·04	·4597309	28822·45	·7619166	577985·12	67
68	·5117842	3249·26	·4077849	25573·19	·7349291	543161·62	68
69	·4742393	2980·16	·3539745	22593·03	·7050791	507083·07	69
70	·4346944	2720·79	·2982516	19872·46	·6722133	470125·02	70
71	·3929538	2471·46	·2405642	17400·60	·6361634	432676·59	71
72	·3488109	2232·60	·1809481	15168·69	·5967432	395132·90	72
73	·3021797	2006·69	·1193021	13161·40	·5538819	357999·07	73
74	·2541607	1795·40	4·0556390	11366 82	·5074517	321700·45	74
75	·2040716	1599·82	3·9897377	9766·47	·4572504	286582·99	75
76	·1524230	1420·47	·9214404	8345·27	·4029736	252914·43	76
77	·0994297	1257·27	·8505310	7088 12	·3441762	220890·03	77
78	3·0445879	1108·12	·7767288	5980·38	·2808662	190926·50	78
79	2·9873906	971·38	·6998300	5009·91	·2130611	163328·15	79
80	·9273234	845·91	·6194784	4163·69	·1408219	138299·89	80
81	·8637349	730·69	·5356245	3432·61	5·0642990	115957·54	81
82	·7963078	625·61	·4481604	2806·47	4·9838142	96341·66	82
83	·7254825	531·47	·3570921	2275·58	·8988679	79226·03	83
84	·6518418	448·58	·2621330	1828·66	·8086938	64371·52	84
85	·5759540	376·66	·1613980	1450·10	·7120851	51532·96	85
86	·4984016	315·07	3·0553477	1135·92	·6071364	40470·30	86
87	·4198307	262·92	2·9407007	872·37	·4907263	30954·68	87
88	·3372008	217·37	·8161020	654·79	·3605641	22938·45	88
89	·2474613	176·79	·6788733	477·39	·2139247	16365·33	89
90	·1473355	140·39	·5289039	337·99	4·0476152	11158·75	90
91	2·0333922	107·99	·3612555	229·75	3·8579738	7210·64	91
92	1·9017236	79·75	2·1740016	149·28	·6410048	4375·27	92
93	·7503538	56·28	1·9730354	93·98	·3919702	2465·87	93
94	·5795659	37·98	·7439016	55·45	3·1050297	1273·59	94
95	·3882993	24·45	·5047426	31·97	2·7713229	590·64	95
96	1·1750325	14·97	1·2224563	16·69	2·3805549	240·19	96
97	0·9388313	8·69	0·8796692	7·58	1·9394194	86·98	97
98	·6611471	4·58	0·3180633	2·08	1·4230820	26·49	98
99	0·3180214	2·08	9·8864907	0·77	0·7664128	5·84	99
100	9·8877313	0·77	...	0·00	0·1986571	1·58	100

Table 19.

Friendly Societies.—England and Wales.—Three Districts.—Four-and-half per Cent.

Age x.	$\lambda . D_x$	D_x	$\lambda . N_x$	N_x	$\lambda . N^s_x$	N^s_x	Age x.
10	4·8088371	64392·77	6·0770022	1193994·47	6·2253650	1680251·55	10
11	·7886337	61465·81	·0540492	1132528·66	·2177237	1650911·11	11
12	·7684319	58672·14	·0309463	1073856·52	·2087507	1617151·49	12
13	·7481575	55996·06	6·0076882	1017860·46	·1987557	1580358·75	13
14	·7277350	53423·82	5·9842737	964436·64	·1880202	1541772·11	14
15	·7070929	50943·98	·9607051	913492·66	·1768091	1502481·43	15
16	·6861580	48546·51	·9369891	864946·15	·1653794	1463455·09	16
17	·6648554	46222·71	·9131372	818723·44	·1539820	1425548·45	17
18	·6432557	43980·05	·8891579	774743·39	·1426569	1388855·08	18
19	·6214303	41824·46	·8650560	732918·93	·1314442	1353455·98	19
20	·5994520	39760·51	·8408325	693158·42	·1203789	1319407·39	20
21	·5773910	37791·23	·8164847	655367·19	·1094946	1286751·26	21
22	·5553190	35918·57	·7920053	619448·62	·0988199	1255509·27	22
23	·5332267	34137·11	·7673870	585311·51	·0883480	1225597·62	23
24	·5111139	32442·47	·7426223	552869·04	·0780709	1196935·80	24
25	·4889709	30829·81	·7177032	522039·23	·0679838	1169455·67	25
26	·4667973	29295·25	·6926213	492743·98	·0580809	1143091·28	26
27	·4445830	27834·47	·6673684	464909·51	·0483568	1117781·31	27
28	·4223225	26443·71	·6419358	438465·80	·0388239	1093512·92	28
29	·4000149	25119·72	·6163138	413346·08	·0294927	1070268·31	29
30	·3776545	23859·13	·5904929	389486·95	·0204738	1048030·29	30
31	·3552403	22658·98	·5644624	366827·97	·0114774	1026779·92	31
32	·3327663	21516·24	·5382114	345311·73	6·0028113	1006494·31	32
33	·3102314	20428·26	·5117276	324883·47	5·9943303	987029·74	33
34	·2876342	19392·52	·4849983	305490·95	·9859910	968257·71	34
35	·2649685	18406·38	·4580098	287084·57	·9777545	950067·62	35
36	·2422327	17467·58	·4307473	269616·99	·9695843	932361·49	36
37	·2194255	16573·93	·4031944	253043·06	·9614477	915056·20	37
38	·1965347	15722·97	·3753345	237320·09	·9533147	898079·34	38
39	·1735480	14912·45	·3471497	222407·64	·9451563	881366·09	39
40	·1504579	14140·28	·3186212	208267·36	·9369493	864866·90	40
41	·1272458	13404·35	·2897294	194863·01	·9286710	848537·47	41
42	·1039032	12702·91	·2604532	182160·10	·9203026	832343·44	42
43	·0804158	12034·16	·2307705	170125·94	·9118332	816268·82	43
44	·0567686	11396·43	·2006577	158729·51	·9032548	800303·69	44
45	·0329459	10788·12	·1700897	147941·39	·8945604	784441·20	45
46	4·0089368	10207·91	·1390395	137733·48	·8857453	768679·46	46
47	3·9847300	9654·50	·1074778	128078·98	·8768052	753017·68	47
48	·9602845	9126·08	·0753750	118952·90	·8677101	737411·84	48
49	·9355688	8621·23	·0427002	110331·67	·8584334	721827·43	49
50	·9105496	8138·60	5·0094215	102193·07	·8489529	706240·94	50
51	·8851915	7677·00	4·9755056	94516·07	·8392504	690637·91	51
52	·8594625	7235·40	·9409181	87280·67	·8293116	675012·12	52
53	·8333345	6812·94	·9056217	80467·73	·8191032	659330·58	53
54	·8067896	6408·99	·8695763	74058·74	·8085975	643572·53	54
55	3·7798081	6022·93	4·8327376	68035·81	5·7977713	627727·75	55

TABLE 19—(*continued*).

Friendly Societies.—England and Wales.—Three Districts.—Four-and-half per Cent.

Age x.	$\lambda . D_x$	D_x	$\lambda . N_x$	N_x	$\lambda . N^s_x$	N^s_x	Age x.
55	3·7798081	6022·93	4·8327376	68035·81	5·7977713	627727·75	55
56	·7523681	5654·16	·7950569	62381·65	·7866067	611795·98	56
57	·7244458	5302·07	·7564808	57079·58	·7750889	595784·06	57
58	·6960146	4966·09	·7169502	52113·49	·7630661	579516·93	58
59	·6670450	4645·63	·6763996	47467·86	·7504015	562861·46	59
60	·6375044	4340·15	·6347564	43127·71	·7369711	545722·82	60
61	·6073709	4049·22	·5919377	39078·49	·7226675	528040·91	61
62	·5766126	3772·36	·5478501	35306·13	·7073872	509785·18	62
63	·5450699	3508·08	·5024005	31798·05	·6907594	490636·00	63
64	·5125952	3255·33	·4554953	28542·72	·6724384	470368·71	64
65	·4790292	3013·21	·4070425	25529·51	·6520967	448845·32	65
66	·4442056	2781·03	·3569524	22748·48	·6294163	426006·52	66
67	·4079753	2558·44	·3051372	20190·04	·6040805	401865·28	67
68	·3701431	2345·00	·2515176	17845·04	·5759656	376673·95	68
69	·3305153	2140·50	·1960252	15704·54	·5449353	350699·58	69
70	·2888874	1944·86	·1386083	13759·68	·5108389	324219·34	70
71	·2450639	1758·18	·0792355	12001·50	·4735105	297516·13	71
72	·1988380	1580·66	4·0179027	10420·84	·4327658	270873·08	72
73	·1504238	1413·92	3·9545763	9006·92	·3885399	244646·98	73
74	·1000219	1258·99	·8891857	7747·93	·3407086	219133·42	74
75	3·0478498	1116·48	·8216085	6631·45	·2890718	194568·17	75
76	2·9941182	986·55	·7516563	5644·90	·2333240	171129·14	76
77	·9390420	869·04	·6790516	4775·86	·1730144	148941·40	77
78	·8821170	762·28	·6035319	4013·58	·1081871	128280·83	78
79	·8228370	665·02	·5248581	3348·56	5·0287877	109342·16	79
80	·7606869	576·35	·4428262	2772·21	4·9649633	92249·33	80
81	·6950154	495·47	·3573134	2276·74	·8868505	77063·82	81
82	·6255053	422·19	·2682286	1854·55	·8047880	63795·21	82
83	·5525971	356·94	·1753987	1497·61	·7182793	52273·23	83
84	·4768734	299·83	3·0783770	1197·78	·6265585	42321·25	84
85	·3989026	250·55	2·9764554	947·23	·5284158	33761·04	85
86	·3192673	208·58	·8684387	738·65	·4219363	26420·21	86
87	·2386134	173·23	·7523712	565·42	·3039767	20136·16	87
88	·1539005	142·53	·6262274	422·89	·1722418	14867·63	88
89	2·0620782	115·37	·4878734	307·52	4·0240023	10568·23	89
90	1·9598694	91·17	·3351569	216·35	3·8560016	7178·96	90
91	·8438431	69·80	2·1659858	146·55	·6647548	4621·20	91
92	·7100916	51·30	1·9786598	95·25	·4460880	2793·11	92
93	·5566388	36 03	·7724684	59·22	3·1953239	1567·92	93
94	·3837679	24·20	·5443161	35·02	2·9066259	806·54	94
95	1·1904184	15·50	·2904798	19·52	·5711263	372·50	95
96	0·9750686	9·44	1·0034605	10·08	2·1785165	150·84	96
97	·7367844	5·45	0·6655810	4·63	1·7355989	54·40	97
98	·4570173	2·86	0·2479733	1·77	1·2177471	16·51	98
99	0·1118086	1·29	9·6812412	0·48	0·5599066	3·63	99
100	1·6794356	0·48	...	0·00	9·9912261	0·98	100

Table 20.

Friendly Societies.—England and Wales.—Three Districts.—Five per Cent.

Age x.	$\lambda . D_x$	D_x	$\lambda . N_x$	N_x	$\lambda . N^s_x$	N^s_x	Age x.
10	4·7881070	61391·33	6·0215511	1050875·09	6·1366873	1369894·81	10
11	·7658306	58321·75	5·9967524	992553·34	·1277493	1341990·21	11
12	·7435558	55405·88	·9718079	937147·46	·1172831	1310035·58	12
13	·7212084	52626·98	·9467101	884520·48	·1056407	1275375·83	13
14	·6987129	49970·41	·9214524	834550·07	·0931411	1239199·28	14
15	·6759978	47423·96	·8960443	787126·11	·0800988	1202538·07	15
16	·6529898	44976·93	·8704912	742149·18	·0668092	1166296·92	16
17	·6296142	42620·08	·8448057	699529·10	·0535637	1131263·19	17
18	·6059415	40359·10	·8189974	659170·00	·0404094	1097512·25	18
19	·5820431	38198·22	·7930718	620971·78	·0273932	1065106·85	19
20	·5579918	36140·31	·7670307	584831·47	·0145567	1034086·17	20
21	·5338578	34186·75	·7408735	550644·72	6·0019395	1004475·81	21
22	·5097128	32337·97	·7145869	518306·75	5·9895755	976282·58	22
23	·4855475	30587·75	·6881697	487719·00	·9774577	949418·40	23
24	·4613617	28930·89	·6616121	458788·11	·9655777	923799·30	24
25	·4371457	27361·87	·6349065	431426·24	·9539304	899353·41	25
26	·4128991	25876·12	·6080445	405550·12	·9425100	876011·74	26
27	·3886117	24468·75	·5810178	381081·37	·9313106	853710·31	27
28	·3642782	23135·46	·5538174	357945·91	·9203469	832428·47	28
29	·3398976	21872·46	·5264342	336073·45	·9096317	812141·49	29
30	·3154642	20675·89	·4988583	315397·56	·8991776	792825·45	30
31	·2909770	19542·36	·4710792	295855·20	·8889968	774455·18	31
32	·2664300	18468·43	·4430857	277386·77	·8790973	757002·42	32
33	·2418221	17451·07	·4148659	259935·70	·8694287	740335·79	33
34	·2171519	16487·39	·3864068	243448·31	·8599417	724338·69	34
35	·1924132	15574·46	·3576945	227873·85	·8505919	708911·32	35
36	·1676044	14709·72	·3287141	213164·13	·8413381	693965·91	36
37	·1427241	13890·70	·2994494	199273·43	·8321437	679428·41	37
38	·1177603	13114·76	·2698833	186158·67	·8229745	665234·15	38
39	·0927006	12379·43	·2399979	173779·24	·8137994	651327·39	39
40	·0675375	11682·54	2097742	162096·70	·8045920	637664·13	40
41	·0422524	11021·80	·1791923	151074·90	·7953278	624205·84	41
42	4·0168368	10395·29	·1482312	140679·61	·7859860	610922·39	42
43	3·9912763	9801·13	·1168683	130878·48	·7765559	597799·98	43
44	·9655562	9237·54	·0850798	121640·94	·7670288	584828·98	44
45	·9396605	8702·83	·0528405	112938·11	·7573981	572002·77	45
46	·9135784	8195·55	5·0201232	104742·56	·7476594	559318·71	46
47	·8872986	7714·34	4·9868981	97028·22	·7378087	546775·11	47
48	·8607800	7257·38	·9531353	89770·84	·7278143	534335·84	48
49	·8339913	6823·25	·9188038	82947·59	·7176479	521972·80	49
50	·8068991	6410·61	·8838713	76536·98	·7072865	509666·99	50
51	·7794680	6018·22	·8483046	70518·76	·6967117	497406·78	51
52	·7516660	5645·03	·8120689	64873·73	·6859093	485187·16	52
53	·7234650	5290·11	·7751269	59583·62	·6748450	472982·34	53
54	·6948472	4952·76	·7374381	54630·86	·6634902	460776·37	54
55	3·6657927	4632·26	4·6989578	49998·60	5·6518221	448561·66	55

TABLE 20—(*continued*).

Friendly Societies.—England and Wales.—Three Districts.—Five per Cent.

Age x.	$\lambda . D_x$	D_x	$\lambda . N_x$	N_x	$\lambda . N^s_x$	N^s_x	Age x.
55	3·6657927	4632·26	4·6989578	49998·60	5·6518221	448561·66	55
56	·6362797	4327·93	·6596374	45670·67	·6398234	436338·38	56
57	·6062844	4039·10	·6194227	41631·57	·6274807	424112·10	57
58	·5757801	3765·13	·5782545	37866·44	·6146337	411750·09	58
59	·5447373	3505·40	·5360663	34361·04	·6011396	399153·25	59
60	·5131239	3259·30	·4927847	31101·74	·5868715	386252·70	60
61	·4809174	3026·34	·4483260	28075·40	·5717165	373006·60	61
62	·4480861	2805·99	·4025952	25269·41	·5555730	359395·75	62
63	·4144704	2596·99	·3554979	22672·42	·5380541	345186·76	63
64	·3799227	2398·41	·3069396	20274·01	·5188030	330219·73	64
65	·3442837	2209·45	·2568274	18064·56	·4974836	314400·78	65
66	·3073871	2029·49	·2050709	16035·07	·4737715	297694·99	66
67	·2690838	1858·16	·1515815	14176·91	·4473534	280120·59	67
68	·2291786	1695·03	·0962800	12481·88	·4180842	261869·08	68
69	·1874777	1539·85	4·0390979	10942·03	·3858562	243139·86	69
70	·1437768	1392·44	3·9799847	9549·59	·3505132	224136·79	70
71	·0978803	1252·80	·9189101	8296·79	·3118915	205064·96	71
72	3·0495814	1120·91	·8558731	7175·85	·2698087	186126·71	72
73	2·9990942	997·92	·7908430	6177·93	·2242056	167573·61	73
74	·9466193	884·34	·7237503	5293·59	·1749621	149610·53	74
75	·8923712	780·50	·6544740	4513·09	·1218797	132397·47	75
76	·8365696	686·39	·5828244	3826·70	·0646517	116051·77	76
77	·7794204	601·76	·5085217	3224·94	5·0028240	100652·37	77
78	·7204226	525·32	·4313026	2699·62	4·9364192	86381·19	78
79	·6590693	456·11	·3509280	2243·51	·8654694	73361·70	79
80	·5948462	393·41	·2671952	1850·10	·7900534	61667·09	80
81	·5271017	336·59	·1799853	1513·51	·7103452	51326·92	81
82	·4555186	285·44	3·0892231	1228·07	·6266999	42335·03	82
83	·3805374	240·18	2·9947086	987·89	·5386235	34563·98	83
84	·3027407	200·79	·8960290	787·10	·4453517	27883·78	84
85	·2226969	166·99	·7924687	620·11	·3456709	22165·16	85
86	·1409886	138·35	·6828307	481·76	·2376569	17284·50	86
87	2·0582617	114·36	·5651392	367·40	4·1181576	13126·76	87
88	1·9714758	93·64	·4373700	273·76	3·9848503	9657·18	88
89	·8775804	75·44	·2973665	198·32	·8350117	6839·30	89
90	·7732986	59·33	2·1429836	138·99	·6654412	4628·51	90
91	·6551993	45·21	1·9721102	93·78	·4724712	2968·05	91
92	·5193748	33·07	·7832602	60·71	3·2521075	1786·93	92
93	·3638490	23·11	·5751878	37·60	2·9996133	999·11	93
94	1·1889051	15·45	·3453737	22·15	·7091512	511·86	94
95	0·9934826	9·85	1·0899051	12·30	2·3718434	235·42	95
96	·7760598	5·97	0·8014037	6·33	1·9774492	94·94	96
97	·5357026	3·43	·4623980	2·90	·5327544	34·10	97
98	0·2538625	1·79	0·0453230	1·11	1·0132587	10·31	98
99	1·9065808	·81	9·4771213	0·30	0·3541084	2·26	99
100	1·4721347	·30	...	0·00	9·7853298	0·61	100

The use of the five Table **16, 17, 18, 19,** and **20,** immediately preceding will be sufficiently understood from the explanations given in pp. 495-6, 532-3, and pp. 544-9 *ante.* It will be observed that by the aid of column N^s the values of Sickness Benefits are determined with the same facility as ordinary questions of life contingencies are solved by means of the usual N columns. Examples and formula will be found in page 496 *ante.* The results in Tables A H to A N inclusive, and in Tables A Q to A S inclusive, were determined by the ordinary method of calculating annuities, and not by the Commutation System of Barrett, on which the five preceding Tables were constructed.

The formula by which the values of the Sickness Benefits in Tables A G to A S inclusive were formed are given in page 486. The Commutation System however, as appears from the following examples, offers much greater facilities for the solution of the more complicated questions.

The following Examples shew the differences between the values arrived at by the two series of Tables.

Immediate Annuity.—Age 40 .

$\lambda . N_{40} = 5{\cdot}6544931$
$\lambda . D_{40} = 4{\cdot}4016205$
$1{\cdot}2528726 = 17{\cdot}90081 =$ Result by Table **16.**
$17{\cdot}90117 =$ Do. Table A H.

Deferred Annuity.—Age 40 .

$\lambda . N_{70} = 4{\cdot}6206303$
$\lambda . D_{40} = 4{\cdot}4016205$
$0{\cdot}2190098 = 1{\cdot}65581 =$ Result by Table **16.**
$1{\cdot}65581 =$ Do. Table A I.

Temporary Annuity.—Age 40 .

$N_{40} = 451329$
$N_{70} = 41747$
$409582\,\lambda = 5{\cdot}6123408$
$\lambda\, D_{40} = 4{\cdot}4016205$
$1{\cdot}2107203 = 16{\cdot}24502 =$ Result by Table **16.**
$16{\cdot}24536 =$ Do. Table A K.

Sum at Death.—Single Premium.—Age 40 . . . . .

$\lambda . N_{89} = 5{\cdot}6781009$
$\lambda . D_{40} = 4{\cdot}4016205$
$1{\cdot}2764804 = 18{\cdot}90081$
$(1 - r) = \cdot02913$
$\cdot55058$
$1{\cdot}00000$
$\cdot44942 =$ Result by Table **16.**
$\cdot44948 =$ Do. Table A L.

Sum at Death.—Annual Premium.—Age 40 . . . . .

$\lambda.D_{40} = 4{\cdot}4016205$
$\lambda.N_{39} = 5{\cdot}6781009$
$8{\cdot}7235196 = {\cdot}05291$
$(1-r) = {\cdot}02913$
${\cdot}02378$ = Result by Table **16.**
${\cdot}02378$ = Do. Table A M.

Sum at Death.—Temporary Annual Premium, until 70.—Age 40 .

$\frac{A_{40}}{1 + {}_{30|}a_{(40)}} = \frac{{\cdot}44942}{17{\cdot}24502} = {\cdot}02606$ = Result by Table **16.**
${\cdot}02606$ = Do. Table A N.

Sickness, until Age 70.—Single Premium.—Age 40 . . .

$N^s_{40} = 2228516$
$N^s_{70} = 995814$
$1232702\,\lambda = 6{\cdot}0908581$
$\lambda.D_{40} = 4{\cdot}4016205$
$1{\cdot}6892376 = 48{\cdot}89198$ = Result by Table **16.**
$48{\cdot}83092$ = Do. Table A Q.

Sickness, until Age 70.—Temporary Annual Premium.—Age 40. .

$N^s_{40} = 2228516$
$N^s_{70} = 995814$
$1232702\,\lambda = 6{\cdot}0908581$
$N_{39} = 476542$
$N_{69} = 47098$
$429444\,\lambda = 5{\cdot}6329065$
$0{\cdot}4579516 = 2{\cdot}87046$ = Result by Table **16.**
$2{\cdot}83154$ = Do. Table A R.

Sickness.—Whole of Life.—Single Premium.—Age 40 . . .

$\lambda.N^s_{40} = 6{\cdot}3480157$
$\lambda.D_{40} = 4{\cdot}4016205$
$1{\cdot}9463952 = 88{\cdot}38839$ = Result by Table **16.**
$88{\cdot}33321$ = Do. Table A S.

Sickness.—Whole of Life.—Annual Premium.—Age 40 . . .

$\lambda.N^s_{40} = 6{\cdot}3480157$
$\lambda.N_{39} = 5{\cdot}6781009$
$0{\cdot}6699148 = 4{\cdot}67643$ = Result by Table **16.**
$4{\cdot}67342$ = Do. Table A S.

Sickness.—Whole of Life.—Temporary Annual Premium, until Age 70.—Age 40 . . . .

$\lambda.N^s_{40} = 6{\cdot}3480157$
$\lambda.(N_{39} - N_{69}) = 5{\cdot}6329065$
$0{\cdot}7151092 = 5{\cdot}18931$ = Result by Table **16.**
$5{\cdot}12214$ = Do. Table A S.

The Tables in pp. 470-80 *ante* are all calculated at three per cent. interest, but by the five tables in pp. 582-91 questions may be solved at not only 3 but also $3\frac{1}{2}$, 4, $4\frac{1}{2}$, and 5 per cent. interest. Although so high a rate as 5 per cent. is seldom realized by Friendly or Benefit Societies still there are a few instances, such as the Society in connection with Mr. Beaumont's Lead Mines, which is under the guidance of Mr. Sopwith, so favourably known in scientific and philanthropic circles, there is the Society formed by the workmen on the London and South-Western Railway and others, in all of which the employers guarantee this high rate of interest. There is also the likelihood at present of other extensive employers granting similar encouragement to the formation of Friendly Societies amongst their workmen, and in every such instance the present tables will be found highly useful as well as important in the solution of questions of a merely curious and speculative character.

It was remarked in page 544 *ante*, that whenever occasion arose for the valuation of Life Contingencies at other rates of interest than those on which the preceding Tables are calculated, it could be done by a simple mode of approximation. In Mr. Thomson's Actuarial Tables, page 13, a method is suggested of adding the successive logarithmic differences between the known and the required rate of interest to the logarithms of the successive values of temporary annuities from the given age to the extreme of the Table, and then affecting the summation of the natural numbers of the results. For short period annuities, whether deferred or immediate, and with the aid of Mr. Thomson's Table IV, the plan is both simple and convenient, but for whole life immediate annuities, except at very advanced ages, the method is very tedious and irksome. The following mode of approximation, the demonstration of which is given in a very elegant form by Mr. Bullen in the " Post Magazine" for November 16th, 1850, will be found exceedingly convenient and useful in every case in which a table has been formed by the Commutation System at only one rate of interest, and a ready means is required by which to determine the corresponding values of annuities at other rates of interest.

In order to shew its practical utility and the extent to which the results arrived at by such means of approximation may be relied on, let it be assumed that of the series of ten Tables, **2** to **11** inclusive, pp. 534-43, only one had been actually constructed, namely, that for 5 per cent., and that it is required to find by approximation the values of annuities according to the rates of interest on which each of the remaining nine Tables of the series was calculated. If this were done and the results compared with the values obtained by direct calculation, it would enable any one to judge how far the method is applicable for the purpose proposed.

Table **6**, page 538, having been formed,

Let r = Rate of interest on which the Commutation Table has been formed,

r' = Rate of interest for which the value of the Annuity is required. Also let

a_x = Value of an Annuity of £.1 at age x, according to the Commutation Table which has been actually constructed, and

a'_x = Corresponding value of an Annuity of £.1 at age x for the required rate of interest.

Then if the summation of Column N in the Commutation Table which has been formed be continued in another series of Columns, so that

$${}^1N_x = \Sigma N_x$$

$${}^2N_x = \Sigma {}^1N_{x+1}$$

$${}^3N_x = \Sigma {}^2N_{x+1}$$

$${}^4N_x = \Sigma {}^3N_{x+1} \text{ and}$$

$${}^nN_x = \Sigma {}^{n-1}N_{x+1} \text{ then will}$$

$$a'_x = a_x - \frac{{}^1N_x}{D_x} \cdot k + \frac{{}^2N_x}{D_x} \cdot k^2 - \frac{{}^3N_x}{D_x} \cdot k^3 + \frac{{}^4N_x}{D_x} - \cdot k^4 \text{ &c. &c. . . . (1)}$$

$$\text{In which } k = \frac{r' - r}{1 + r'}$$

If, however, in the equation we make

$$\frac{{}^1N_x}{D_x} = A_x$$

$$\frac{{}^2N_x}{D_x} = B_x$$

$$\frac{{}^3N_x}{D_x} = C_x, \text{ &c. &c. &c. then will}$$

$$a'_x = a_x - A_x \cdot k + B_x \cdot k^2 - C_x \cdot k^3 + D_x \cdot k^4 - \text{ &c. &c. . . . . (2)}$$

As the quantity k will always be a very small fraction, and therefore, as in page 575, rapidly converge, more than four terms will seldom be required in the series.

The following Abstract will shew the manner in which the quantities ${}^1N_x$, ${}^2N_x$, ${}^3N_x$, &c. &c. are derived from Table **6,** page 538.

Abstract showing the Process of Finding the Coefficients ${}^1N_x$, ${}^2N_x$, ${}^3N_x$, *&c. &c., from* TABLE **6.**

Age x	From Table 6. D_x / $\lambda . D_x$	From Table 6. N_x / $\lambda . N_x$	${}^1N_x$ / $\lambda . {}^1N_x$	${}^2N_x$ / $\lambda . {}^2N_x$	${}^3N_x$ / $\lambda . {}^3N_x$	${}^4N_x$ / $\lambda . {}^4N_x$
10	61391·32	1008559·17	15924128·15	209761198·25	2429628771·74	24782505461·14
	4·7881070	6·0037014	7·2020557	8 3217252	9·3855400	0·3941454
11	58005·45	950553·72	14915568·98	194845629·27	2234783142·47	22547722318·67
	·7634688	5·9779767	·1736399	·2896906	·3492353	·3531026
12	54855·72	895698·00	13965015·26	180880614·01	2053902528·46	20493819790·21
	·7392219	·9521616	·1450415	·2573919	·3125799	·3116229
13	51912·63	843785·37	13069317·26	167811296·75	1886091231·71	18607728558·50
	·7152730	·9262320	·1162531	·2248212	·2755626	·2696934
14	49149·68	794635·69	12225531·89	155585764·86	1730505466·85	16877223091·65
	·6915207	·9001681	·0872678	·1919700	·2381729	·2273009
15	46542·25	748093·44	11430896·20	144154868·66	1586350598·19	15290872493·46
	·6678474	·8739558	·0580803	·1588293	·2003993	·1844322
16	44068·50	704024·94	10682802·76	133472065·90	1452878532·29	13837993961·17
	·6441282	·8475881	7·0286852	·1253905	·1622294	·1410730
17	41709·09	662315·85	9978777·82	123493288·08	1329385244·21	12508608716·96
	·6202307	·8210652	6·9990773	·0916435	·1236508	·0972091
18	39458·68	622857·17	9316461·97	114176826·11	1215208418·10	11293400298·86
	·5961425	·7943884	·9692510	·0575780	·0846507	·0528247
19	37313·36	585543·81	8693604·80	105483221·31	1109725196·79	10183675102·07
	4·5718643	5·7675594	6·9392000	8·0231833	9·0452155	0·0079047
97	1·241244	1·8086132	4·2239816	5·2048059	5·3947477	4·4498049
	0·0938571	0·2573456	0·6257220	0·7164045	0·7319711	0·6483410
98	·7461716	1·0624416	2·4153686	2·7894373	2·6053104	1·8444945
	9·8728387	0·0263052	·3829835	0·4455168	·4158594	0·2658775
99	·4471440	·6152976	1·3529270	1·4365103	1·1688001	·6756944
	·6504474	9·7890852	0·1312744	0·1573086	0·0677402	9·8297504
100	·2661571	·3491405	·7376294	·6988809	·4699192	·2057752
	·4251381	·5430002	9·8678387	9·8444032	9·6720232	9·3133931
101	·1520898	·1970507	·3884889	·3103920	·1595272	·0462480
	9·1821001	·2945780	·5893787	·4919105	9·2028346	8·6650930
102	·0896675	·1073832	·1914382	·1189538	·0405734	·0056746
	8·9526349	9·0309363	9·2820287	9·0753783	8·6082414	7·7539353
103	·0525524	·0548308	·0840550	·0348988	·0056746	
	·7205922	8·7390246	8·9245636	8·5428104	7·7539343	
104	·0312812	·0285496	·0292242	·0056746		
	·4952829	8·3719902	8·4657427	7·7539343		
105	·0178750	·0056746	·0056746			
	8·2522449	7·7539343	7·7539343			
106	·0056746					
	7·7539343					

If from the logs. of the above coefficients ${}^1N_x$, ${}^2N_x$, ${}^3N_x$, &c. be substracted the corresponding $\lambda . D_x$ there will be produced $\lambda . A_x$, $\lambda . B_x$, $\lambda . C_x$, and $\lambda . D_x$, which form the fourth, fifth, sixth, and seventh columns of Table **21,** and afford a ready means of solving Equation (2) preceding.

It will be observed that, for the same rate of interest, k is constant for every age in the Table, and as the logs. of the first four powers of k may be written on a slip of paper, so as to cover precisely the spaces occupied by the fourth, fifth, sixth, and seventh columns of Table **21,** it will be easy to write down by inspection the sum of the logs. of both factors in each term of Equation (2), namely,

$$\lambda.A_x.k, \quad \lambda.B_x.k^2, \quad \lambda.C_x.k^3, \quad \text{and} \quad \lambda.D_x.k^4$$

without writing the log. of each factor separately, and by this means the value of the annuity a'_x is speedily obtained. For example, in the case now under consideration,

r = ·05, and in order to find the values of Annuities at Six per Cent.

$\frac{r'-r}{1+r'} = \frac{\cdot06-\cdot05}{1+\cdot06} = \frac{1}{106} = \cdot0094340 = k$ which is constant for finding all values at Six per Cent. In like manner will

$\frac{r'-r}{1+r'} = \frac{\cdot07-\cdot05}{1+\cdot07} = \frac{2}{107} = \cdot0186916 = k$ at Seven per Cent., and which is of course constant, and in a similar manner for any other rate of interest, say Ten per Cent.

$\frac{r'-r}{1+r'} = \frac{\cdot10-\cdot05}{1+\cdot10} = \frac{5}{110} = \cdot0454545 = k$ at Ten per Cent., and is constant for that rate of interest.

If in order, therefore, to avoid writing the logs. of both factors in each member of Equation (2), the logs. of the first four powers of k for each difference in the rate of interest were previously prepared and neatly written on slips of paper, so that they might be placed exactly superincumbent on the columns $\lambda.A_x$, $\lambda.B_x$, $\lambda.C_x$, and $\lambda.D_x$ of Table **21,** addition may be performed by inspection, and the sum of the logs. of both factors written down at once, by which the values of Annuities, at any rate of interest, are obtained with little more trouble than that required to find them directly from a Commutation Table constructed for the particular rate of interest.

The following logs., as arranged in horizontal lines, will be constant for all ages, when a Commutation Table has been calculated at Five per Cent., and it is required to derive from it the values of corresponding Annuities at

		$\lambda.k$	$\lambda.k^2$	$\lambda.k^3$	$\lambda.k^4$
3 per Cent.	$k = \cdot0194175$ and	8·2881933	6·5763866	4·8645799	3·1527732
$3\frac{1}{2}$ „	$k = \cdot0144928$ „	8·1611523	6·3223046	4·4834569	2·6446092
4 „	$k = \cdot0096154$ „	7·9829674	5·9659348	3·9489022	1·9318696
$4\frac{1}{2}$ „	$k = \cdot0047847$ „	7·6798547	5·3597094	3·0395641	0·7194188
6 „	$k = \cdot0094340$ „	7·9746942	5·9493884	3·9240826	1·8987768
7 „	$k = \cdot0186916$ „	8·2716462	6·5432924	4·8149386	3·0865848
8 „	$k = \cdot0277778$ „	8·4436975	6·8873950	5·3310925	3·7747900
9 „	$k = \cdot0366972$ „	8·5646335	7·1292670	5·6939005	4·2585340
10 „	$k = \cdot0454545$ „	8·6575773	7·3151546	5·9727319	4·6303092

[This much

Table 21.

Age	a_x	Table 6. $\lambda.N_x - \lambda.D_x = \lambda.a_x$	$\lambda.A_x$	$\lambda.B_x$	$\lambda.C_x$	$\lambda.D_x$	Age
10	16·42837	1·2155944	2·4139487	3·5336182	4·5974330	5·6060384	10
11	16 38732	·2145079	·4101711	·5262218	·5857665	·5896338	11
12	16·32825	·2129397	·4058196	·5181700	·5733580	·5724010	12
13	16·25395	·2109590	·4009801	·5095482	·5602896	·5544204	13
14	16·16767	·2086474	·3957471	·5004493	·5466522	·5357802	14
15	16·07342	·2061084	·3902329	·4909819	·5325519	·5165848	15
16	15·97570	·2034599	·3845570	·4812623	·5181012	·4969448	16
17	15·87942	·2008345	·3788466	·4714128	·5034201	·4769784	17
18	15·78505	·1982459	·3731185	·4614355	·4885082	·4567322	18
19	15·69260	·1956951	·3673357	·4513190	·4733512	·4360404	19
20	15·60154	·1931675	·3615060	·4410373	·4579197	·4150210	20
21	15·51113	·1906432	·3555928	·4305583	·4421798	·3935885	21
22	15·42055	·1881001	·3495713	4198499	·4260959	·3717045	22
23	15·32954	·1855290	·3434142	·4088920	·4096455	·3493413	23
24	15·23827	·1829358	·3371817	·3976787	·3928197	·3264967	24
25	15·14683	·1803216	·3307129	·3861987	·3756045	·3031453	25
26	15·05453	·1776670	·3241303	·3744204	·3579658	·2792533	26
27	14·96047	·1749453	·3173502	·3623064	·3398629	·2547778	27
28	14 86108	·1721380	·3103472	·3498276	·3212638	·2296836	28
29	14·76468	·1692210	·3030945	·3369537	·3021351	·2039347	29
30	14·66122	·1661701	·2955540	·3236420	·2824320	·1774832	30
31	14·55347	·1629665	·2877113	·3098754	·2621326	·1502948	31
32	14·44118	·1596028	·2795514	·2956344	·2412152	·1223741	32
33	14·32391	·1560616	·2710529	·2808940	·2196510	·0936593	33
34	14·20174	·1523414	·2622096	·2656441	·1974259	·0641431	34
35	14·07437	·1484290	·2530040	·2498626	·1745148	·0337966	35
36	13·94171	·1443158	·2434229	·2335327	·1508963	5·0025955	36
37	13 80361	·1399927	·2334532	·2166355	·1265484	4·9705134	37
38	13·65996	·1354494	·2230798	·1991526	·1014478	·9375238	38
39	13·51080	·1306811	·2122933	·1810686	·0755748	·9036028	39
40	13·35638	·1256888	·2010889	·1623743	·0489164	·8687331	40
41	13·19621	·1204493	·1894388	·1430361	4·0214338	·8328720	41
42	13·03073	·1149685	·1773423	·1230479	3·9931160	·7960045	42
43	12·85960	·1092274	·1647753	·1023797	·9639290	·7580915	43
44	12·68308	·1032248	·1517294	0810176	·9338533	·7191091	44
45	12·50107	·0969472	·1381860	·0589357	·9028575	·6790211	45
46	12·31343	·0903789	·1241195	·0361054	·8709078	·6377890	46
47	12·11984	·0834968	·1095037	3·0124909	·8379632	·5953663	47
48	11·92034	·0762884	·0943189	2 9880674	·8039925	·5517172	48
49	11·71476	·0687334	·0785392	·9628020	·7689571	·5067971	49
50	11·50314	·0608164	·0621435	·9366668	·7328231	·4605669	50
51	11·28531	·0525134	·0451027	·9096256	·6955475	·4129779	51
52	11·06203	·0438348	·0274211	·8816745	·6571202	·3640144	52
53	10·83319	·0347561	2·0090681	·8527756	·6174963	·3136255	53
54	10·59924	·0252746	1·9900332	·8229102	·5766500	·2617799	54
55	10·36048	·0153799	·9702995	·7920524	·5345491	·2084386	55
56	10·11705	1·0050541	·9498414	·7601688	·4911520	·1535550	56
57	9·86858	0·9942548	1·9286111	2·7252027	3·4463953	4·0970592	57

TABLE **21**—(*continued*).

Age	a_x	Table **6.** $\lambda.N_x - \lambda.D_x = \lambda.a_x$	$\lambda.A$	$\lambda.B_x$	$\lambda.C_x$	$\lambda.D_x$	Age
58	9·61615	0·9830010	1·9066198	2·6931561	3·4002734	4·0389399	58
59	9·35890	·9712246	·8837953	·6579483	·3526983	3·9791034	59
60	9·09779	·9589357	·8601427	·6215748	·3036583	·9175321	60
61	8·83278	·9460973	·8356212	·5839861	·2530960	·8541639	61
62	8·56516	·9327356	·8102515	·5451918	·2010144	·7889969	62
63	8·29475	·9188032	·7839819	·5051314	·1473458	·7219592	63
64	8·02288	·9043304	·7568354	·4638171	·0920964	·6530532	64
65	7·74943	·8892698	·7287606	·4211882	3·0352001	·5822104	65
66	7·47569	·8736515	·6997774	·3772556	2·9766638	·5094353	66
67	7·20090	·8573870	·6697965	·3319228	·9163873	·4346274	67
68	6·92642	·8405085	·6388355	·2852009	·8543801	·3577957	68
69	6·65108	·8228918	·6068051	·2369974	·7905494	·2788486	69
70	6·37672	·8045974	·5737386	·1873435	·7249270	·1978206	70
71	6·10290	·7855361	·5395710	·1361749	·6574517	·1146538	71
72	5·83124	·7657680	·5043708	·0835634	·5881993	3·0294302	72
73	5·56173	·7452101	·4680791	2·0294568	·5171235	2·9411095	73
74	5·29595	·7239440	·4307952	1·9739636	·4443400	·8528174	74
75	5·03308	·7018336	·3924282	·9170068	·3697802	·7614972	75
76	4·77578	·6790443	·3531761	·8587965	·2936631	·6683849	76
77	4·52377	·6555003	·3130194	·7993275	·2159951	·5735084	77
78	4·28008	·6314516	·2722374	·7388873	·1370790	·4772006	78
79	4·04512	·6069316	·2308958	·6775484	2·0570108	·3795962	79
80	3·82101	·5821784	·1892265	·6155490	1·9760633	.2810150	80
81	3·60582	·5570040	·1470663	·5527472	·8941437	·1814188	81
82	3·40093	·5315981	·1045943	·4893527	·8115279	2·0811415	82
83	3·20407	·5057020	·0615905	·4252111	·7281407	1·9821650	83
84	3·01474	·4792493	1·0180571	·3604202	·6441664	·8787215	84
85	2·83223	·4521285	0·9740081	·2951222	·5598275	·7770694	85
86	2·65733	·4244461	·9298796	·2298949	·4757614	·6758716	86
87	2·49170	·3964957	·8858716	·1649543	·3922763	·5754213	87
88	2·34430	·3700132	·8435900	·1019945	·3111703	·4774179	88
89	2·20064	·3425484	·8009402	1·0391694	·2306276	·3798427	89
90	2·06847	·3156499	·7595438	0·9782351	·1523659	·2840588	90
91	1·94648	·2892498	·7194873	9194201	·0764422	·1895750	91
92	1·83450	·2635179	·6811355	·8631629	1·0029200	·0956803	92
93	1·73529	·2393728	·6454127	·8102728	0·9319802	1·0015124	93
94	1·64659	·2165841	·6121939	·7603446	·8622212	0·9043484	94
95	1·57001	·1959017	·5821350	·7133241	·7921842	·8011074	95
96	1·50664	·1780081	·5554923	·6681845	·7190162	·6869246	96
97	1·45710	·1634885	·5318649	·6225474	·6381140	·5544839	97
98	1·42386	·1534665	·5101448	·5726781	·5430207	·3930388	98
99	1·37606	·1386378	·4808270	·5068612	·4172928	0·1793030	99
100	1·31178	·1178621	·4427006	·4192651	·3468851	9·8882550	100
101	1·29562	·1124779	·4072786	·3098104	0·0207345	9·4829929	101
102	1·19757	·0783014	·3293938	0·1227434	9·6556065	8·8013004	102
103	1·04336	0·0184324	0·2039704	9·8222182	9·0333431		103
104	·75285	9·8767073	9·9704598	9·2586524			104
105	·31746	9·5016904	9·5016904				105
106							106

This much being explained, the means are now given by which to test the practical merits of this mode of approximating to the values of Annuities.

For example, if it were required to find the value of an Annuity at any age x, say age 40, assuming the rate of interest Six per Cent., then the process of calculation is as follows:—

$\lambda.A_x = 2{\cdot}2010889$ $\quad$ $\lambda.B_x = 3{\cdot}1623743$

$\lambda.k = 7{\cdot}9746942$ $\quad$ $\lambda.k^2 = 5{\cdot}9493884$

$0{\cdot}1757831 = -\ 1{\cdot}49894 = A_x.k$ $\quad$ $9{\cdot}1117627 = +\ {\cdot}12935 = B_x.k^2$

$\lambda.C_x = 4{\cdot}0489164$ $\quad$ $\lambda.D_x = 4{\cdot}8687331$

$\lambda.k^3 = 3{\cdot}9240826$ $\quad$ $\lambda.k^4 = 1{\cdot}8987768$

$7{\cdot}9729990 = -\ {\cdot}00940 = C_x.k^3$ $\quad$ $6{\cdot}7675099 = +\ {\cdot}00059 = D_x.k^4$

$-\ 1{\cdot}50834 = (A_x.k) + (C_x.k^3)$ $\quad$ $+\ {\cdot}12994 = (B_x.k^2) + (D_x.k^4)$

$+\ {\cdot}12994$

$-\ 1{\cdot}37840$

a_{40} at 5 per cent. $= 13{\cdot}35638$ $\quad$ $11{\cdot}97798 = a'_{40}$ at 6 per cent. by approximation.

$11{\cdot}97794 = a_{40}$ at 6 per cent. by direct calculation from Table **7.**

In this example the logarithms of the two factors $A_x.k$ &c. &c. are kept separate, but as already stated, this is unnecessary, as it is easy for any one accustomed to calculations of the sort to write down at once the sum of the logarithms by inspection as follows:—

$\lambda.A_x.k = 0{\cdot}1757831 = -\ 1{\cdot}49849 = A_x.k$ $\quad$ $\lambda.B_x.k^2 = 9{\cdot}1117627 = +\ {\cdot}12935 = B_x.k^2$

$\lambda.C_x.k^3 = 7{\cdot}9729990 = -\ {\cdot}00940 = C_x.k^3$ $\quad$ $\lambda.D_x.k^4 = 6{\cdot}7675099 = +\ {\cdot}00059 = D_x.k^4$

$-\ 1{\cdot}50834 = (A_x.k) + (C_x.k^3)$ $\quad$ $+\ {\cdot}12994 = (B_x.k^2) + (D_x.k^4)$

$+\ {\cdot}12994$

$-\ 1{\cdot}37840$

a_{40} at 5 per cent. $= 13{\cdot}35638$ $\quad$ $11{\cdot}97798 = a'_{40}$ at 6 per cent by approximation

$11{\cdot}97794 = a_{40}$ at 6 per cent. by direct calculation from Table **7.**

$\lambda.A_x.k = 0{\cdot}4727351 = -\ 2{\cdot}96985 = A_x.k$ $\quad$ $\lambda.B_x.k^2 = 9{\cdot}7056667 = +\ {\cdot}50777 = B_x.k^2$

$\lambda.C_x.k^3 = 8{\cdot}8638550 = -\ {\cdot}07309 = C_x.k^3$ $\quad$ $\lambda.D_x.k^4 = 7{\cdot}9553179 = +\ {\cdot}00902 = D_x.k^4$

$-\ 3{\cdot}04294 = (A_x.k) + (C_x.k^3)$ $\quad$ $+\ {\cdot}51679 = (B_x.k^2) + (D_x.k^4)$

$+\ {\cdot}51679$

$-\ 2{\cdot}52615$

a_{40} at 5 per cent. $= 13{\cdot}35638$ $\quad$ $10{\cdot}83023 = a'_{40}$ at 7 per cent. by approximation.

$10{\cdot}82934 = a_{40}$ at 7 per cent. by direct calculation from Table **8.**

$\lambda.A_x.k = 0{\cdot}6447864 = -\ 4{\cdot}41353 = A_x.k$ $\qquad$ $\lambda.B_x.k^2 = 0{\cdot}0497693 = +\ 1{\cdot}12142 = B_x.k^2$

$\lambda.C_x.k^3 = 9{\cdot}3800089 = -\ {\cdot}23989 = C_x.k^3$ $\qquad$ $\lambda.D_x.k^4 = 8{\cdot}6435231 = +\ {\cdot}04401 = D_x.k^4$

$-\ 4{\cdot}65342 = (A_x.k) + (C_x.k^3)$ $\qquad$ $+\ 1{\cdot}16543 = (B_x.k^2) + (D_x.k^4)$

$+\ 1{\cdot}16543$

$-\ 3{\cdot}48799$

a_{40} at 5 per cent. $=\ 13{\cdot}35638$ $\qquad$ $9{\cdot}86839 = a'_{40}$ at 8 per cent. by approximation.

$9{\cdot}86223 = a_{40}$ at 8 per cent. by direct calculation from Table **9.**

$\lambda.A_x.k = 0\ 7657224 = -\ 5{\cdot}83072 = A_x.k$ $\qquad$ $\lambda.B_x.k^2 = 0{\cdot}2916413 = +\ 1{\cdot}95723 = B_x.k^2$

$\lambda.C_x.k^3 = 9{\cdot}7428169 = -\ {\cdot}53312 = C_x.k^3$ $\qquad$ $\lambda.D_x.k^4 = 9{\cdot}1272671 = +\ {\cdot}13405 = D_x.k^4$

$-\ 6{\cdot}36384 = (A_x.k) + (C_x.k^3)$ $\qquad$ $+\ 2{\cdot}09128 = (B_x.k^2) + (D_x.k^4)$

$+\ 2{\cdot}09128$

$-\ 4{\cdot}27256$

a_{40} at 5 per cent. $=\ 13{\cdot}35638$ $\qquad$ $9{\cdot}08382 = a'_{40}$ at 9 per cent. by approximation.

$9{\cdot}04002 = a_{40}$ at 9 per cent. by direct calculation from Table **10.**

$\lambda.A_x.k = 0{\cdot}8586662 = -\ 7{\cdot}22215 = A_x.k$ $\qquad$ $\lambda.B_x.k^2 = 0{\cdot}4775289 = +\ 3\ 00282 = B_x.k^2$

$\lambda.C_x.k^3 = 0{\cdot}0216483 = -\ 1{\cdot}05111 = C_x.k^3$ $\qquad$ $\lambda.D_x.k^4 = 9{\cdot}4990423 = +\ {\cdot}31553 = D_x.k^4$

$-\ 8{\cdot}27326 = (A_x.k) + (C_x.k^3)$ $\qquad$ $+\ 3{\cdot}31835 = (B_x.k^2) + (D_x.k^4)$

$+\ 3{\cdot}31835$

$-\ 4{\cdot}95491$

a_{40} at 5 per cent. $=\ 13{\cdot}35638$ $\qquad$ $8{\cdot}40147 = a'_{40}$ at 10 per cent. by approximation.

$8{\cdot}33469 = a_{40}$ at 10 per cent. by direct calculation from Table **11.**

In the next place when it is required to find the values of annuities at a less rate o interest than that on which the Commutation Table has been constructed, it is obvious that the signs of all the terms of the series in Equation (2) will be changed, thus

$$a'_x = a_x + A_x.k - B_x.k^2 + C_x.k^3 - D_x\ k^4 + \&c.\ \&c.$$

Hence to find the value of an annuity at $4\frac{1}{2}$ per cent.:—

$\lambda.A_x.k = 9{\cdot}8809436 = +\ {\cdot}76023 = A_x.k$ $\qquad$ $\lambda.B_x.k^2 = 8{\cdot}5220837 = -\ {\cdot}03327 = B_x.k^2$

$\lambda.C_x.k^3 = 7{\cdot}0884805 = +\ {\cdot}00123 = C_x.k^3$ $\qquad$ $\lambda.D_x.k^4 = 5{\cdot}5881519 = -\ {\cdot}00004 = D_x.k^4$

$+\ {\cdot}76146 = (A_x.k) + (C_x.k^3)$ $\qquad$ $-\ {\cdot}03331 = (B_x.k^2) + (D_x.k^4)$

$-\ {\cdot}03331$

$+\ {\cdot}79477$

a_{40} at 5 per cent. $=\ 13{\cdot}35638$ $\qquad$ $14{\cdot}15115 = a'_{40}$ at $4\frac{1}{2}$ per cent. by approximation.

$14{\cdot}15114 = a_{40}$ at $4\frac{1}{2}$ per cent. by direct calculation from Table **5.**

$\lambda.A_x.k = 0{\cdot}1840563 = +\ 1{\cdot}52776 = A_x.k$ $\qquad$ $\lambda.B_x.k^2 = 9{\cdot}1283091 = -\ {\cdot}13437 = B_x.k_2$

$\lambda\ C_x.k^3 = 7{\cdot}9978186 = +\ {\cdot}00995 = C_x.k^3$ $\qquad$ $\lambda.D_x.k^4 = 6{\cdot}8006027 = -\ {\cdot}00063 = D_x.k^4$

$+\ 1{\cdot}53771 = (A_x.k) + (C_x.k^3)$ $\qquad$ $-\ {\cdot}13500 = (B_x.k^2) + (D_x.k^4)$

$-\ {\cdot}13550$

$+\ 1{\cdot}67271$

a_{40} at 5 per cent. $= 13{\cdot}35638$ $\qquad$ $15{\cdot}02909 = a'_{40}$ at 4 per cent. by approximation.

$15{\cdot}02912 = a_{40}$ at 4 per cent. by direct calculation from Table **4.**

$\lambda.A_x.k = 0{\cdot}3622412 = +\ 2{\cdot}30272 = A_x.k$ $\qquad$ $\lambda.B_x.k^2 = 9{\cdot}4846789 = -\ {\cdot}30527 = B_x.k^2$

$\lambda.C_x.k^3 = 8{\cdot}5323733 = +\ {\cdot}03407 = C_x.k^3$ $\qquad$ $\lambda.D_x.k^4 = 7{\cdot}5133423 = -\ {\cdot}00326 = D_x.k^4$

$+\ 2{\cdot}33679 = (A_x.k) + (C_x.k^3)$ $\qquad$ $-\ {\cdot}30853 = (B_x.k^2) + (D_x.k^4)$

$-\ {\cdot}30853$

$+\ 2{\cdot}64532$

a_{40} at 5 per cent. $= 13{\cdot}35638$ $\qquad$ $16{\cdot}00170 = a'_{40}$ at $3\frac{1}{2}$ per cent. by approximation.

$16{\cdot}00196 = a_{40}$ at $3\frac{1}{2}$ per cent. by direct calculation from Table **3.**

$\lambda.A_x.k = 0{\cdot}4892822 = +\ 3{\cdot}08519 = A_x.k$ $\qquad$ $\lambda.B_x.k^2 = 9{\cdot}7387609 = -\ {\cdot}54798 = B_x.k^2$

$\lambda.C_x.k^3 = 8{\cdot}9134963 = +\ {\cdot}08194 = C_x.k^3$ $\qquad$ $\lambda.D_x.k^4 = 8{\cdot}0215063 = -\ {\cdot}01051 = D_x.k^4$

$+\ 3{\cdot}16713 = (A_x.k) + (C_x.k^3)$ $\qquad$ $-\ {\cdot}55849 = (B_x.k^2) + (D_x.k^4)$

$-\ {\cdot}55849$

$+\ 3{\cdot}72562$

a_{40} at 5 per cent. $= 13{\cdot}35638$ $\qquad$ $17{\cdot}08200 = a'_{40}$ at 3 per cent. by approximation.

$17{\cdot}08322 = a_{40}$ at 3 per cent. by direct calculation from Table **2.**

In like manner may an Auxiliary Table be formed for Joint Lives. The process is precisely similar to that employed in the construction of Table **21,** and needs no further explanation more than observing that a series of difference columns will be needed for each disparity of age. The following specimen has been selected for illustration, in which the disparity of age is fifty years, and it has been deduced from the $N_{x,y}$ column, Table **14,** page 573, in exactly the same manner in which Table **21** was formed from Table **6.** By means of Table **22,** may Joint Annuities, for all ages in which the disparity of age is 50 years, be determined at any rate of interest. After the preceding illustrations in respect to Single Lives, the following cases for Joint Lives will be easily understood.

In the following examples, in consequence of the Commutation Table from which the calculations are made having been constructed at 7 per cent., the constants k, k^2, k^3, &c. &c. will have a different value from those given in page 597 *ante*, which were prepared so as to apply to a Commutation Table of 5 per cent. In approximating to the [values of

TABLE 22.

Disparity 50 *Years.*

Ages.		$a_{x,y}$	TABLE 14. $\lambda.N_{(x,y)+1} - \lambda.D_{x,y} = \lambda.\, a_{x,y}$	$\lambda.A_{x,y}$	$\lambda.B_{x,y}$	$\lambda.C_{x,y}$	$\lambda.D_{x,y}$
x	y						
10	60	7·48604	0·8742521	1·7239286	2·4390996	3·0838689	3·6663932
11	61	7·31068	·8639580	·7031249	·4059418	3·0382217	·6082751
12	62	7·12466	·8527641	·6810288	·3711143	2·9905857	·5478831
13	63	6·92895	·8406676	·6576637	·3346412	·9409798	·4852309
14	64	6·72638	·8277811	·6331595	·2966499	·8895255	·4204364
15	65	6·51800	·8141141	·6075457	·2571653	·8362414	·3535139
16	66	6·30725	·7998399	·5809968	·2163533	·7812881	·2846210
17	67	6·09477	·7849576	·5535128	·1742049	·7246513	·2137426
18	68	5·88221	·7695404	·5251569	·1307742	·6663829	·1409287
19	69	5·66907	·7535118	·4958497	·0859759	·6063959	3·0660931
20	70	5·45552	·7368364	·4655582	2·0397733	·5446532	2·9891995
21	71	5·24164	·7194675	·4342409	1·9921234	·4811141	·9102101
22	72	5·02817	·7014101	·4019115	·9430427	·4157978	·8291472
23	73	4·81490	·6825875	·3685157	·8924824	·3486602	·7459719
24	74	4·60331	·6630702	·3341404	·8405366	·2798001	·6607904
25	75	4·39289	·6427500	·2987172	·7871493	·2091676	·5735617
26	76	4·18569	·6217673	·2624133	·7324974	·1369459	·4844828
27	77	3·98126	·6000209	·2251827	·6765467	2·0631087	·3935471
28	78	3·78229	·5777542	·1872939	·6195696	1·9879390	·3010647
29	79	3·58914	·5549899	·1487967	·5616185	·9115080	·2081449
30	80	3·40359	·5319368	·1098882	·5028907	·8340441	·1120639
31	81	3·22404	·5084000	·0703970	·4432304	·7554371	2·0157690
32	82	3·05180	·4845565	·0304867	·3828263	·6759392	1·9185774
33	83	2·88505	·4601531	·9899411	·3215215	·5954727	·8204785
34	84	2·72352	·4351310	·9487681	·2584125	·5142232	·7217227
35	85	2·56646	·4093348	·9069509	·1966014	·4323819	·6225607
36	86	2·41596	·3830896	·8649334	·1336463	·3505963	·5236873
37	87	2·27144	·3563019	·8228339	·0707795	·2691866	·4254471
38	88	2·14236	·3308932	·7823024	1.0096756	·1899647	·3295988
39	89	2·01556	·3043950	·7412351	0·9485056	·1111693	·2342285
40	90	1·89822	·2783463	·7012459	·8890343	1·0345795	·1408102
41	91	1·78936	·2526984	·6624276	·8315301	0·9603576	1·0489953
42	92	1·68872	·2275564	·6251182	·7764699	·8886670	0·9581922
43	93	1·59916	·2038919	·5902948	·7247715	·8198629	·8677000
44	94	1·51864	·1814545	·5578549	·6761460	·7526989	·7749054
45	95	1·44884	·1610211	·5285351	·6307133	·6858859	·6768303
46	96	1·39089	·1432918	·5026876	·5876100	·6166909	·5686582
47	97	1·34558	·1289095	·4800591	·5446206	·5406087	·4431031
48	98	1·31585	·1192046	·4597583	·4981736	·4513206	·2894239
49	99	1·27308	·1048566	·4323637	·4367336	·3324201	0·0841917
50	100	1·21545	·0847368	·3968942	·3546989	0·1697476	9·8022618
51	101	1·20469	·0808742	·3653236	·2518422	9·9520836	9·4064106
52	102	1·11976	0·0491261	·2924679	0·0723967	9·5959201	8·7338274
53	103	·98329	9·9926836	0·1731569	9·7800033	8·9820885	
54	104	·71710	·8555775	9·9467801	9·2241995		
55	105	·30494	9·4842120	9·4842120			
56	106						

values of Annuities therefore by means of Table **22,** the following will be the value of $\lambda.k$ for different rates of interest:—

$$\frac{r'-r}{1+r'} = \frac{\cdot03-\cdot07}{1\cdot03} = \frac{4}{103} = \cdot0388349 \text{ and } 8\cdot5892221 = \lambda.k \text{ at } 3 \text{ per cent.}$$

$$\frac{r'-r}{1+r'} = \frac{\cdot035-\cdot07}{1\cdot035} = \frac{35}{1035} = \cdot0338164 \ldots 8\cdot5291273 = \lambda.k \ldots 3\tfrac{1}{2} \ldots$$

$$\frac{r'-r}{1+r'} = \frac{\cdot04-\cdot07}{1\cdot04} = \frac{3}{104} = \cdot0288461 \ldots 8\cdot4600871 = \lambda.k \ldots 4 \ldots$$

$$\frac{r'-r}{1+r'} = \frac{\cdot045-\cdot07}{1\cdot045} = \frac{25}{1045} = \cdot0239234 \ldots 8\cdot3788228 = \lambda.k \ldots 4\tfrac{1}{2} \ldots$$

$$\frac{r'-r}{1+r'} = \frac{\cdot05-\cdot07}{1\cdot05} = \frac{2}{105} = \cdot0190476 \ldots 8\cdot2798403 = \lambda.k \ldots 5 \ldots$$

$$\frac{r'-r}{1+r'} = \frac{\cdot06-\cdot07}{1\cdot06} = \frac{1}{106} = \cdot0094340 \ldots 7\cdot9746959 = \lambda.k \ldots 6 \ldots$$

$$\frac{r'-r}{1+r'} = \frac{\cdot08-\cdot07}{1\cdot08} = \frac{1}{108} = \cdot0092593 \ldots 7\cdot9665782 = \lambda.k \ldots 8 \ldots$$

$$\frac{r'-r}{1+r'} = \frac{\cdot09-\cdot07}{1\cdot09} = \frac{2}{109} = \cdot0183486 \ldots 8\cdot2636029 = \lambda.k \ldots 9 \ldots$$

$$\frac{r'-r}{1+r'} = \frac{\cdot10-\cdot07}{1\cdot10} = \frac{3}{110} = \cdot0272727 \ldots 8\cdot4357281 = \lambda.k \ldots 10 \ldots$$

AGES.

10 — 60

$\lambda.A_{x,y}.k = 9\cdot6905068 = \cdot49035 = A_{x,y}.k$ $\quad$ $\lambda.B_{x,y}.k^2 = 8\cdot3722560 = \cdot02356 = B_{x,y}.k^2$

$\lambda.C_{x,y}.k^3 = 6\cdot9836035 = \cdot00096 = C_{x,y}.k^3$ $\quad$ $\lambda.D_{x,y}.k^4 = 5\cdot5327060 = \cdot00003 = D_{x,y}.k^4$

$\cdot49131 = (A_{x,y}.k) + (C_{x,y}.k^3)$ $\quad$ $\cdot02359 = (B_{x,y}.k^2) + (D_{x,y}.k^4)$

$\cdot02359$

$\cdot46772$

$a_{10,60}$ at 7 per cent. $= 7\cdot48604$ $\quad$ $7\cdot01832 = a'_{x,y}$ at 8 per cent.

10 — 60

$\lambda.A_{x,y}.k = 0\cdot1596567 = 1\cdot44430 = A_{x,y}.k$ $\quad$ $\lambda.B_{x,y}.k^2 = 9\ 3105558 = \cdot20444 = B_{x,y}.k^2$

$\lambda.C_{x,y}.k^3 = 8\cdot3910532 = \cdot02461 = C_{x,y}.k^3$ $\quad$ $\lambda.D_{x,y}.k^4 = 7\cdot4093056 = \cdot00257 = D_{x,y}.k^4$

$1\cdot46891$ $\quad$ $\cdot20701$

$\cdot20701$

$1\cdot26190$

$a_{10,60}$ at 7 per cent. $= 7\cdot48604$ $\quad$ $6\cdot22414 = a'_{x,y}$ at 10 per cent.

Ages.

10 — 60

$\lambda.A_{x,y}.k = 0{\cdot}0037689 = 1{\cdot}00872 = A_{x,y}.k$ $\quad \lambda.B_{x,y}.k^2 = 8{\cdot}9987802 = {\cdot}09972 = B_{x,y}.k^2$

$\lambda.C_{x,y}.k^3 = 7{\cdot}9233898 = {\cdot}00838 = C_{x,y}.k^3$ $\quad \lambda.D_{x,y}.k^4 = 6{\cdot}7857544 = {\cdot}00061 = D_{x,y}.k^4$

$1{\cdot}01710$ $\qquad {\cdot}10033$

$\cdot10033$

$1{\cdot}11743$

$a_{10,60}$ at 7 per cent. $= 7{\cdot}48604$ $\qquad 8{\cdot}60347 = a'_{x,y}$ at 5 per cent.

10 — 60

$\lambda.A_{x,y}.k = 0{\cdot}3131507 = 2{\cdot}05660 = A_{x,y}.k$ $\quad \lambda.B_{x,y}.k^2 = 9{\cdot}6175438 = {\cdot}41452 = B_{x,y}.k^2$

$\lambda.C_{x,y}.k^3 = 8{\cdot}8515352 = {\cdot}07105 = C_{x,y}.k^3$ $\quad \lambda.D_{x,y}.k^4 = 8{\cdot}0232816 = {\cdot}01055 = D_{x,y}.k^4$

$2{\cdot}12765$ $\qquad {\cdot}42507$

$\cdot42507$

$2{\cdot}55272$

$a_{10,60}$ at 7 per cent. $= 7{\cdot}48604$ $\qquad 10{\cdot}03876 = a'_{x,y}$ at 3 per cent.

20 — 70

$\lambda.A_{x,y}.k = 9{\cdot}7291611 = {\cdot}53600 = A_{x,y}.k$ $\quad \lambda.B_{x,y}.k^2 = 8{\cdot}5669791 = {\cdot}03690 = B_{x,y}.k^2$

$\lambda.C_{x,y}.k^3 = 7{\cdot}3354619 = {\cdot}00217 = C_{x,y}.k^2$ $\quad \lambda.D_{x,y}.k^4 = 6{\cdot}0436111 = {\cdot}00011 = D_{x,y}.k^4$

$\cdot53817 = (A_{x,y}.k) + (C_{x,y}.k^3)$ $\qquad {\cdot}03701 = (B_{x,y}.k^2) + (D_{x,y}.k^4)$

$\cdot03701$

$\cdot50116$

$a_{20,70}$ at 7 per cent. $= 5{\cdot}45552$ $\qquad 4{\cdot}95436 = a'_{x,y}$ at 9 per cent.

20 — 70

$\lambda.A_{x,y}.k = 9{\cdot}4402541 = {\cdot}27558 = A_{x,y}.k$ $\quad \lambda.B_{x,y}.k^2 = 7{\cdot}9891651 = {\cdot}00975 = B_{x,y}.k^2$

$\lambda.C_{x,y}.k^3 = 6{\cdot}4687409 = {\cdot}00029 = C_{x,y}.k^3$ $\quad \lambda.D_{x,y}.k^4 = 4{\cdot}8879831 = {\cdot}00001 = D_{x,y}.k^4$

$\cdot27587$ $\qquad {\cdot}00976$

$\cdot00976$

$\cdot28563$

$a_{20,70}$ at 7 per cent. $= 5{\cdot}45552$ $\qquad 5{\cdot}74115 = a'_{x,y}$ at 6 per cent.

20 — 70

$\lambda.A_{x,y}.k = 9{\cdot}8443810 = {\cdot}69885 = A_{x,y}.k$ $\quad \lambda.B_{x,y}.k^2 = 8{\cdot}7974189 = {\cdot}06272 = B_{x,y}.k^2$

$\lambda.C_{x,y}.k^3 = 7{\cdot}6811216 = {\cdot}00480 = C_{x,y}.k^3$ $\quad \lambda.D_{x,y}.k^4 = 6{\cdot}5044907 = {\cdot}00032 = D_{x,y}.k^4$

$\cdot70365$ $\qquad {\cdot}06304$

$\cdot06304$

$\cdot76669$

$a_{20,70}$ at 7 per cent. $= 5{\cdot}45552$ $\qquad 6{\cdot}22221 = a'_{x,y}$ at $4\frac{1}{2}$ per cent.

Ages.

20 — 70 $\left\{\begin{array}{l} \lambda.A_{x,y}.k = 9{\cdot}9256453 = {\cdot}84265 = A_{x,y}.k \\ \lambda.C_{x,y}.k^3 = 7{\cdot}9249145 = {\cdot}00841 = C_{x,y}.k^3 \end{array}\right.$ $\left\{\begin{array}{l} \lambda.B_{x,y}.k^2 = 8{\cdot}9599475 = {\cdot}09119 = B_{x,y}.k^2 \\ \lambda.D_{x,y}.k^4 = 6{\cdot}8295479 = {\cdot}00068 = D_{x,y}.k^4 \end{array}\right.$

	·85106	·09187
	·09187	
	·94293	
$a_{20,70}$ at 7 per cent. =	5·45552	6·39845 = $a'_{x,y}$ at 4 per cent.

20 — 70 $\left\{\begin{array}{l} \lambda.A_{x,y}.k = 9{\cdot}9946855 = {\cdot}98784 = A_{x,y}.k \\ \lambda.C_{x,y}.k^3 = 8{\cdot}1320351 = {\cdot}01355 = C_{x,y}.k^3 \end{array}\right.$ $\left\{\begin{array}{l} \lambda.B_{x,y}.k^2 = 9{\cdot}0980279 = {\cdot}12532 = B_{x,y}.k^2 \\ \lambda.D_{x,y}.k^4 = 7{\cdot}1057087 = {\cdot}00128 = D_{x,y}.k^4 \end{array}\right.$

	1·00139 = $(A_{x,y}.k) + (C_{x,y}.k^3)$	·12660 = $(B_{x,y}.k^2) + (D_{x,y}.k^4)$
	·12660	
	1·12799	
$a_{20,70}$ at 7 per cent. =	5·45552	6·58351 = $a'_{x,y}$ at $3\frac{1}{2}$ per cent.

APPENDIX.

NOTE I.—(*page* 10.)

Expectation of Life.

Ages.	Milne. Carlisle, A.D. 1779—1787. Both Sexes.	Deparcieux. Tontine Nominees. Both Sexes.	Demonferrand. France, A.D. 1817—1832.		Assured Lives.		Ages.
			Males.	Females.	Equitable. Davies.	Amicable. Galloway.	
10	48·82	46·83	47·00	47·42	48·83	...	10
15	45·00	43·50	43·58	43·66	44·81	...	15
20	41·46	40·25	40·00	40·08	41·06	...	20
25	37·86	37·17	37·25	36·83	37·44	37·805	25
30	34·34	34·08	34·00	33·41	33·98	33·681	30
35	31·00	30·92	30·50	30·00	30·66	29·721	35
40	27·61	27·50	27·00	26·58	27·40	25·944	40
45	24·46	23·92	23·41	23·16	24·10	22·365	45
50	21·11	20·42	19·91	19·58	20·83	18·994	50
55	17·58	17·25	16·50	16·25	17·85	15·832	55
60	14·34	14·25	13·25	13·16	15·06	12·878	60
65	11·79	11·25	10·58	10·50	12·35	10·264	65
70	9·18	8·67	8·08	8·08	9·84	8·113	70
75	7·01	6·50	6·16	6·16	7·52	6·345	75
80	5·51	4·67	4·75	4·75	5·38	4·884	80

Ages.	Milne.					Duvillard. France. Both Sexes.	Price. Northampton. A.D. 1735-1780. Both Sexes.	Ages.
	Sweden and Finland. A.D. 1776—1795.			Montpellier. A.D. 1772—1792.				
	Males.	Females.	Both Sexes.	Males.	Females.			
10	45·03	47·28	46·16	44·12	46·77	40·80	39·78	10
15	41·51	43·74	42·63	40·06	43·02	37·40	36·51	15
20	37·86	40·04	38·96	36·52	39·45	34·26	33·43	20
25	34·48	36·44	35·47	33·49	36·32	31·34	30·85	25
30	31·22	33·00	32·12	30·43	33·34	28·52	28·27	30
35	27·95	29·68	28·82	27·30	30·41	25·72	25·68	35
40	24·61	26·27	25·45	24·06	27·45	22·89	23·08	40
45	21·45	23·03	22·26	21·00	24·44	20·05	20·52	45
50	18·36	19·66	19 03	18·23	21·35	17·23	17·99	50
55	15·39	16·37	15·90	15·53	18·42	14·51	15·58	55
60	12·47	13·18	12·85	13·14	15·73	11·95	13·21	60
65	9·92	10·41	10·19	11·01	13·22	9·63	10·88	65
70	7·87	8·12	8·01	9·02	10·79	7·58	8·60	70
75	6·13	6·38	6·27	7·07	8·44	5·87	6·54	75
80	4·75	4·94	4·85	5·17	6·17	4·60	4·75	80

Note II.—(*page* 19.)

Rural Districts.

Anglesea—Beaumaris, Llanerchymedd, Llansadwrn.

Bedfordshire—Ampthill, Dunstable, Eaton Socon, Henlow, Harrold, Maulden, Oakely, St. Loyds, Renhold, Silsoe, Woburn.

Berkshire—Sunning Hill, Maidenhead, Winkfield.

Buckinghamshire—Aylesbury, Dagnall, Eton, Great Marlow, Great Misenden, Lower Winchendon, Newport Pagnell, Stoke Poges, Weston Turville, Wooburn.

Breconshire—Brecknock, Hay, Llomelly, Tassiny, Pridd.

Cambridgeshire—Ickleton, Melbourn, Whittlesford.

Cardiganshire—Yspytty Confin.

Carmarthenshire—Langodock, Pembrey.

Carnarvonshire—Bangor, Carmel, Llandwrog.

Cheshire—Ashton-upon-Mersey, Buglawton, Congleton, Horridge End, Middlewich, Sandbach, Weaverham.

Cornwall—Bodmin, Breaze, Helstone, Kilkhampton, Marazion, Millbrook, North Hill, Church Town, Quethiock, St. Kenerne, C. T., St. Ive, St. Germans, St. Ewe, St. Agnes, Torpoint, Tuckingmill.

Cumberland—Cockermouth.

Derbyshire—Clonn, Cubley, Dronfield, Dale Abbey, Glossip, Middleton, Miller Moor End, Pentrich, Peakforest, Sanley, Thorpe, Walton.

Denbighshire—Llanfair Talhaiam, Llandogla.

Devonshire—Ashford, Bovey Tracy, Broadclist, Bishops Nympton, Chudleigh, Churston Ferrers, Cornworthy, Dodbrook, Great Torrington, Hartland, Holsworthy, Hatherleigh, Hennock, Kingskernell, Kingsbridge, Modbury, Moretonhampstead, Merton, Newton Abbott, Newton Bushel, Northlen, Plymstock, Stokefleming, Totnes, Whitchurch.

Dorsetshire—Hilton, Lyme Regis, Sherborne, Tarrant Munckton, Wyke Regis.

Durham—Burnopfield, Bishop Huckland, Houghton le Spring, Longridge, Monkwearmouth, Sedgefield, Winlaton.

Essex—Arkesden, Chigwell, Castle Hedingham, Dedham, Fordham, Great Baddow, Great Chesterfield, Gestingthorpe, Goldhanger, Hatfield Heath, Leigh, Loughton, Stebbing, St. Osyth, Witham, White Northley, Walthamstow.

Flintshire—Llanhasa, Mold, St. Asaph.

Glamorganshire—Aberayron, Canphilly, Eglurysilan, Gellygear, Llangonoyd, Llanfabon, Pontardylas near Swansea, Lantwit-juxta-Neath.

Gloucestershire—Arlingham, Frampton-on-Severne, John St. Spt. Nily, Lechlade, Newnham, North Verney, Prestbury, Paintneck, Sherborne, Stow-in-the-Wold, Stapeton, Tewkesbury, Tidenham, Winchcomb, Woolaston, Yate, Yatton.

Hampshire—Bitterne, Breamore, Buriton, Burley, Christchurch, Eling, Fordingbridge, Millbrook, Swarthling, Westend, Winchester, Wootton, (Isle of Wight,) West Cowes, I. W.

Hertfordshire—Lemsford Mills, North Mimms, Stevenage.
Huntingdonshire—Deddington, Huntingdon.
Isle of Jersey—St. Heliers.
Kent—Chislehurst, Cranbrook, Queenborough, Seven Oaks, St. Peters, Margate, Wrotham, Woolwich.
Lancashire—Caton, Church Town, Chipping, Dalton, Everton, Hunts Bank, Manchester, Kirkham, Long Ashton, Lathorn, Ribchester, Skelmorsdale.
Leicestershire—Barwell, Markfield, Misterton, Quorndon, Sileby, Whitwitch.
Lincoln—Barrowby, Crowland, Deeping, Dorrington, Horncastle, Sleaford, Sutton Wash, South Witham.
Merionethshire—Blamare, Bala, Llwyngwril, Llanfachreth, Llanderfel, Penlyn, Trawsfynydd.
Monmouthshire—Chepstow, Llanfeangel, Pantengue, Ragland.
Montgomeryshire—Llanidloes, Welsh Pool.
Northamptonshire—Kingsthorpe, Kettering, Little Houghton, Peakirk, Peterborough, Wellingborough.
Norfolk—Aylesham, Hainford, Kirkling, Ludham, Melton Parva, Snettisham, Shipsham, Strumpshaw.
Northumberland—(Not stated.)
Nottinghamshire—Carlton, Stapleford.
Oxfordshire—Banbury, Fritwell, Oxford, Steeple Ashton.
Pembrokeshire—Begelly, St. Florence.
Radnorshire—Presteign.
Shropshire—Ellesmere, Hodnet, Mensterley, Norton, Rayton, Seluttyn, Whitchurch.
Somersetshire—Bath-Easton, Rutleigh Chew Stoke, Marsbury, Badstock, Stogumber, Wellington, Wincanton, Washford.
Staffordshire—Ashley, Biddulph, Bursben, Bloxwich, Cobridge, Endon, Hanley, Lone End, Pelsall, Trentham, Wolstanton, Yovall,
Suffolk—Bungay, Bury St. Edmunds, Haverhill, Lanshall, Sudbury, Withersfield.
Surrey—Dorking, Godalming, Horsley, Kingston, Richmond, Sandon, Tatesfield.
Sussex—Billinghurst, Compton, Loxwood, Rothersfield, Wilmington.
Warwickshire—Alcester, Berkswell, Halford, Knowle, Polesworth.
Wiltshire—Aldbourn, Chisledon, Corsham, Donhead, East Knoyle, Highworth, Malmesbury, Wootten Basset.
Worcestershire—Longdon, Pershore.
Yorkshire—Bentham, Boonsley, Briggatt, Dunkenfield, Driffield, Gildersome, Grassington, Harewood, Hawden, Holmpitch, Headingly, Overblow, Queenshead, Rastrick, Scholes, Stanningly, Steeton, Thorne, Thurstonland.

Town Districts.—(*page* 19.)

Bedfordshire—Bedford.
Breconshire—Crickhowell.
Cambridgeshire—Cambridge.
Cheshire—Astbury and Lanton, Chester.
Cornwall—Camborne, Penzance, Redruth, St. Austell.
Derbyshire—Alfreton, Chesterfield.
Denbighshire—Wrexham.
Dorsetshire—Blandford.
Durham—Stockton, Stockton-on-Tees, Sunderland, South Shields.
Essex—Barking, Chelmsford.
Flintshire—Holywell.
Glamorganshire—Swansea.
Gloucestershire—Cheltenham, Stroud.
Hampshire—Portsea, Southampton, Winchester.
Kent—Deptford, Maidstone.
Lancashire—Ashton, Ashton-under-Lyne, Blackburn, Friargate Preston, (and Town near Manchester.)
Lincoln—Lincoln, Stamford.
Middlesex—Fulham.
Monmouthshire—Bedwelty, Pontypool.
Northamptonshire—Northampton.
Norfolk—Norwich, Great Yarmouth, Yarmouth.
Northumberland—Newcastle, Tynemouth,
Pembrokeshire—Pembroke.
Shropshire—Shrewsbury, Wellington.
Somersetshire—Bath.
Staffordshire—Stafford, Stone, Stoke-upon-Trent, Sedgeley, Tamworth, Walsall, West Bromwich.
Surrey—Beaubridge, Dulwich.
Sussex—Brighton.
Warwickshire—Coventry, Nuneaton.
Wiltshire—Trowbridge.
Worcestershire—Bromsgrove, Dudley.
Yorkshire—Bradford, Halifax, Huddersfield, Whitby.

City Districts.—(*page* 19.)

Devonshire—Devonport.
Gloucestershire—Bristol.
Lancashire—Liverpool and Suburbs.
Middlesex—London and Suburbs.
Warwickshire—Birmingham.
Yorkshire—Leeds, Sheffield, York.

Note III.—(*page* 67.)

List of Districts in Scotland.

Rural Districts.

Aberdour.
Borrowstounness.
Catrine.
Ceres.
Coldingham.
Currie.
Dalry.
Dunbar.
Dunse.
Rosehearty.
Saltcoats.
Greenlaw.
Turriff.
Kirkmichael.
Alexandria.
Anstruther.
Mauchline.
Musselburgh.
Newburgh.
Stranraer.
Douglas.
Stornoway.
Strichen.
Strathaven.
Thornliebank.
Westquarter.
Preston Pans.
Kilwinning.
Stevenston.

Towns.

Arbroath.
Kilmarnock.
Dalkeith.
Campbelltown.

Cities.

Edinburgh.
Glasgow.
Paisley.
Aberdeen.

Note IV.

Factory Trades, forming Table S. S., page 454.

Blanket Weavers.
Cloth Workers.
Cloth Dressers.
Cotton Spinners.
Factorymen.
Flax Dressers.
Flax Weavers.
Frame Work Knitters.
Hemp Dressers.
Lace Manufacturers.
Lace Workers.
Manufacturers.
Needle Makers.
Pin Makers.
Sack Weavers.
Silkmen.
Silk Combers.
Silk Millmen.
Silk Spinners.
Silk Throwsters.
Silk Weavers.
Thread Twisters.
Weavers.
Warpers.
Winders.
Wool Combers.

Note V.

In-door Trades requiring Little Exercise, forming Table T. T., page 455.

Accountants.
Awl Bladers.
Booksellers.
Boot Blockers.
Brass Founders.
Brokers.
Brush and Broom Makers.
Butlers.
Barbers and Hair Dressers.
Basket and Sieve Makers.
Bookbinders.
Braziers.
Clerks.
Cordwainers.
Carders.
Carvers and Gilders.
Chair Bottomers and Cane Workers.
Chandlers.
Chemists and Druggists.
Clickers.
Clothiers.
Confectioners.
Corkcutters.
Cutlers.
Drapers.
Eating-House Keepers.
Edge Tool Makers.
Embroiderers.
Engravers.
File Smiths.
Glovers and Hosiers.
Green Grocers.
Grocers.
Gaffers.
Glass Makers.
Glass Cutters.
Grinders.
Gunsmiths.
Haft Turners.
Ironmongers.
Jewellers.
Lace Manufacturers.
Lace Workmen.
Lawyers.
Meal Men and Flour Dealers.
Music Teachers.
Mat Makers.
Needle Makers.
Poulterers.
Printers.
Pattern Model Makers.
Pin Makers.
Pipe Makers.
Saddlers.
Schoolmasters.
Shopkeepers.
Salemen.
Saw Handle Makers.
Shoemakers.
Shuttle Makers.
Silkmen.
Silk Combers.
Silk Mill Men.
Silk Spinners.
Silk Factors.
Silk Throwsters.
Silversmiths.
Slate Framers.
Spindle Makers.
Spirit Merchants.
Stationers.
Stamp Distributors.
Stirrup and Bit Makers.
Straw Plaiters.
Tobacconists.
Tailors.
Upholsterers.
Victuallers.

Watchmakers.
Weavers.
Whitesmiths.
Warehousemen.
Warpers.
Wine Merchants.
Winders.
Woolmen.
Wool Staplers.

Note VI.

In-door Trades requiring Great Exercise, forming Table V. V., page 456.

Blanket Weavers.
Bakers.
Blacksmiths.
Cabinetmakers.
Coopers.
Curriers.
Cartwrights.
Chairmakers.
Coach Builders.
Coach Smiths.
Copper Smiths.
Engineers.
Forgemen.
Joiners.
Machinemen.
Moulder and Iron Founders.
Millers.
Millwrights.
Nailers.
Sack Weavers.
Turners.
Wheelwrights.
Wool Combers.
Wool Sorters.

Note VII.

Out-door Trades requiring Little Exercise, forming Table W. W., page 457.

Auctioneers.
Botanists.
Butchers.
Coachmen.
Cattle Dealers.
Colliery Agents.
College Porters.
Constables.
Corn Dealers.
Costermongers.
Cowkeepers.
Drivers.
Excise Officers.
Engine Drivers.
Hay Binders.
Horse Keepers.
In Her Majesty's Customs.
Jobbers.
Knackers.
Land Stewards.
Lime Merchants.
Mail Drivers.
Mine Agents.
Ostlers.
Post Boys.
Packmen.
Pig Dealers.
Policemen.
Porters.
Quarry Agents.
Sextons.
Sheriffs' Officers.
Slate Workers.
Turnpike Keepers.
Watchmen.

Note VIII.

Out-door Trades requiring Great Exercise, forming Table Y. Y., page 458.

Bleachers.
Boat Builders.
Boatmen.
Brookers.
Builders.
Bargemen.
Brickmakers.
Bricklayers.
Carriers.
Carters.
Clay Cutters.
Drainers.
Draymen.
Drovers.
Excavators.
Firebrick Manufacturers.
Fishermen.
Farmers.
Gamekeepers.
Gardeners.
Graziers.
Hedgers.
Huntsmen.
Husbandmen.
Hawkers.
In Preventive Service.
Letter Carriers.
Mole Catchers.
Paviors.
Pedlers.
Quarrymen.
Rope Makers.
Sawyers.
Slaters.
Stonemasons.
Shepherds.
Stonecutters.
Surveyors.
Thatchers.
Tile Makers.
Tilers.
Timber Stowers.
Timber Hewers.
Tanners.
Waggoners.
Watermen.
Well Diggers.
Wharfingers.
Yeomen.

Note IX.

Expectation of Life in Ireland.

Age.	Males.	Females.	Age.	Males.	Females.
10	46·6223	48·7375	56	15 0512	16·4081
11	45·7987	47·9506	57	14 5054	15·8327
12	44·9717	47·1564	58	13·9713	15·2707
13	44·1463	46·3635	59	13·4504	14·7240
14	43·3262	45·5727	60	12 9433	14·1938
15	42·5154	44·7866	61	12·4486	13·6784
16	41·7179	44·0077	62	11·9641	13 1760
17	40·9371	43·2383	63	11·4881	12·6848
18	40·1714	42·4773	64	11·0183	12·2030
19	39·4192	41·7239	65	10·5530	11·7287
20	38·6796	40·9770	66	10·0965	11·2651
21	37·9509	40·2358	67	9·6521	10·8149
22	37·2318	39·4991	68	9·2230	10·3806
23	36·5217	38·7667	69	8 8122	9·9643
24	35·8206	38·0387	70	8·4221	9·5683
25	35·1272	37·3144	71	8·0502	9·1902
26	34·4405	36·5942	72	7·6938	8·8277
27	33·7587	35 8777	73	7·3521	8·4792
28	33·0808	35·1651	74	7·0195	8·1425
29	32·4049	34·4563	75	6·6945	7·8156
30	31·7295	33·7515	76	6·3794	7·4989
31	31·0546	33·0499	77	6·0758	7·1929
32	30 3796	32·3516	78	5·7858	6·8979
33	29·7044	31·6557	79	5·5091	6·6145
34	29·0286	30·9626	80	5·2509	6·3422
35	28·3519	30 2714	81	5·0045	6·0796
36	27·6756	29·5816	82	4·7691	5·8243
37	27 0003	28·8936	83	4·5328	5·5741
38	26·3272	28·2068	84	4·3206	5·3265
39	25·6570	27·5210	85	4·1019	5·0783
40	24·9904	26·8362	86	3·8875	4·8314
41	24·3269	26·1517	87	3·6799	4·5860
42	23·6660	25·4670	88	3·4798	4·3426
43	23·0067	24·7817	89	3·2881	4·1005
44	22·3489	24·0956	90	3·1064	3·8595
45	21·6918	23·4599	91	2·9309	3·6143
46	21·0384	22·7229	92	2·7570	3·3579
47	20·3916	22·0433	93	2·5781	3·0798
48	19·7538	21·3722	94	2·3891	2·7698
49	19·1275	20·7123	95	2·1732	2·4398
50	18·5149	20·0658	96	1 9265	2·0898
51	17·9144	19·4319	97	1·6197	1·7251
52	17·3247	18·8091	98	1·3068	1·3446
53	16·7445	18·1959	99	·9489	·9375
54	16·1727	17·5915	100	·5000	·5000
55	15·6075	16·9946			

The above results are deduced from the Report of the Census Commissioners for Ireland, and calculated in the same manner as that described for Tables D and R. The Mortality for the years 1839, 1840 only was taken, in order to avoid the chances of error, connected with the more remote years; as in Ireland, no actual registration of the deaths took place but only were stated from memory at the period of the Census.

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